Co-designing a TRU[e] Park

Workshop Resource Sketchbook

This workshop resource sketch-book is meant as a co-design tool to enable active participation during the TRU-Park Co-design Workshop on the 18 February 2017. It is intended as a toolbox, with a threefold purpose:

[1] share the information gathered as part of the Public Participation of the programme in the workshops leading up to the co-design workshop,

[2] present two scenarios for the development of the TRU-Park area as background for the co-design workshop,

[3] provide an assessment matrix based on the TRU-Park Manifesto, the City making imperatives and the Stakeholders' non-negotiable objectives.

The interactive nature of the workshop resource sketchbook is intended to assist participants to also provide individual comments and to document the process of the workshop. For this purpose the sketchbook incorporates blank spaces for drawing, writing and commenting by each participant.

The first part describes the participatory design process and its outcomes, namely manifesto, non-negotiable objectives, scenarios, city making imperatives and structuring elements. It also describes the next steps of the process to the legislated public engagement during the Local Spatial Development Framework.

The second part contains the baseline findings, constraints and opportunities presented and developed during the participatory process: essential information to nourish and facilitate the decision-making process. These interpretative maps describe the site in its complexity and highlight its potential.

The third part offers an overview of the specialist studies as informants for the design process. It indicates the key findings and status of each specialist study.

The fourth part describes the design exploration emerging from the co-design process through a series of detailed maps. These maps are annotated with comments received and updated findings from the specialist studies.

The last part contains an assessment matrix to evaluate the design explorations against the TRU-Park manifesto, the city making imperatives, the specialist studies, structuring elements with the aim to identify commonalities and differences between the design explorations and to document elements to be taken forward in the local design process.

The book is intended as a shared collective space to consolidate the most important ideas informing the possible future of the TRU-Park site. How can TRU-P's ecological asset be conserved? How can TRU-P connect and be accessible? How can TRU-P trigger social cohesion? How can TRU-P's spaces be socially and ecologically active? In essence, how can a TRU[e] Park be co-designed!

Contents

part 1_ co-design process

1. Co-design approach

A co-design approach is necessary in making of a truly shared vision for the TRU-Park site. The Public Participation Process [PPP] has been, and still is - at this stage - unfolding along with the design and planning process. The public participation approach is inclusively fostering active participation through co-design exercises.

Given the location of the TRUP area in Cape Town, a broader engagement has been necessary including interested and affected parties, as part of the public participation process. This has lead to a wider ownership of issues related to the potential development, which has implications for the broader metropolitan area. In this regard, different engagement intensities were required, to allow a process of engagement which is inclusive and forward looking. The public participation engagement process has acknowledged and taken into consideration the lessons learnt from previous engagements with stakeholders, such as the City of Cape Town and the TRUP Association.

1.1. Who has been involved in the process?

Three different stakeholder engagements have been undertaken over the course of the engagement process. The City of Cape Town and Western Cape Government have a direct interest in whatever development may take place in the TRUP area. All line departments which have direct and indirect interests are to be engaged at an official government level. Such engagement requires that these spheres of government have the same or similar understanding of the proposed TRUP development. While these are two different spheres of government, it is important that the engagement is shared to create one broad vision, rather than competing interests within government. The following stakeholders have taken part of the engagement at government level:

1. Sub-councils and their Wards,
2. Provincial government and line department representatives,
3. City of Cape Town and line department representatives.

The second layer of engagement is those directly affected by the proposed framework plan for the TRUP site. These stakeholders include private owners, leaseholders, associations and forums previously formed. Such stakeholders are an integral part of engagement since any development would alter their stake within TRUP. Other than Province and CoCT as part of this layer of engagement, the key stakeholders within this boundary should include:

1. Associations / Forum
    a. TRUP Association
    b. The Oude Molen Forum
    c. Western Cape Diverse Traditional Leaders Forum
2. Landowners
3. Private businesses operating in the area
4. Civic and Ratepayers Associations from areas such as Mowbray, Pinelands, Maitland, Observatory, Kensington, Kewtown, Langa and Athlone.

These forums and associations have constitutions which are inclusive of other stakeholders such as NGOS, CBO and businesses operating in the area.

The third layer of the stakeholder group includes the interested and affected stakeholders. These stakeholders include surrounding businesses, research institutions and individuals.

LEVEL 1

government line departments

national / parastatal

WCG

CoCT

sub-councils / wards

LEVEL 2

directly affected stakeholders

LAND OWNERS

INSTITUTIONS

ASSOCIATIONS / FORUMS

PRIVATE BUSINESSES

LEVEL 2

neighbouring /interested parties

CIVIC ASSOCIA-TIONS

NGOs

RESEARCH / PROFES-SIONAL

SURROUNDING BUSINESSES

SA Heritage Resources Agency

Public Works

NATIONAL / PARASTATAL

TRANSNET

PRASA

Agriculture

Western Cape Education Department

Community Safety

Local Government

Agriculture

Environment & Development Planning

Human Settlements

WCG

Cultural Affairs & Sport

Social Development

Department of the Primier / Green Economy

Transport & Public Works

Economic Develop-ment & Tourism

Regeneration Project Office

Health

Chamber of Commerce

Climate Change & Tourism [Environment]

Transport Cape Town

Stormwa-ter

CoCT

Parks & Recreation

Spatial Planning and Urban Design

UCT Sociology Dep. / Rike Sitas

UCT Urban Water Management research unit

UCT / migration Research / Henrietta

UDISA / Urban Design Institute of South

RESEARCH / PROFESSIONAL

UCT / African Centre for Cities

Ndifunda Ukwazi

CHEC / Cape Higher Education Consortium

Cape Trust

NGOs

Renewable Energy Initiative

WESSA WC / Wild Life Society of Southern Africa

Simon van der Stel Foundation

WC Economic Development Forum

ASSOCIATIONS / FORUMS

WC Diverse Traditional Leaders Forum

FROG - Friends of Rosebank and Mowbray Green-

Friends of the Liesbeek

TRUP Steering Committee [to be setup]

WC Council of Nguni People

TRUP Association

Oude Molen Tenants Association

Transnet

Trans-net

CoCT

National Govt

Alex-andra Hospital

WCG

MGV Primary

CoCT

The River Club

Raapen-berg Bird Sanctuary

SAAO

SKA

CoCT

Black River Office Park

Observatory Civic Association

subcouncil 15/ ward 57 / Brett Herran

Valken-berg Hospital

WCG

WCG

Gaia Waldorf School

Pinelands Resident Asso-ciation

sub-council 15 / ward 53 / Brian Wat-kyns

The Wild Fig

Western Province Chinese School

CoCT

CoCT

Robin Trust

Langa Civic Asso-ciataion

Protea Hotel Mow-bray

Vincent Pilloti Prvt Hospital

Mary Kihn School for the Partially Hearing

other sub-councils / wards

Rosebank and Mowbray Civic Associ-ation

Rosebank Rate Payers Association

Rondebosch Resident Association

subcouncil 20 / Ian Iverson

sub-council 20/ member Alexis Fernandes

subcouncil 20 / ward 58 / Matthew

sub-council 17 / ward 48 / Magedien Davis

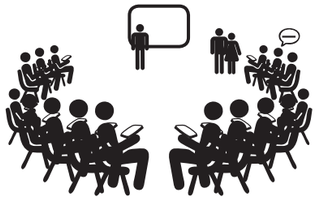
subcouncil 11 / ward 49 / Suzette Little

subcoun-cil 15 / ward 51 / Neliswa Ngq-ose

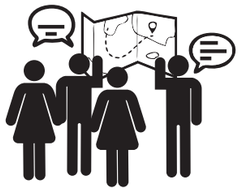
subcoun-cil 15 / ward 52 / mayenzeke Sopaqa

1.2. How is co-design conducted?

The Public Participation Process is unfolding along with the design and planning process at this stage. It is fostering co-design workshops, where the different stakeholders can actively participate in the co-design process. In ensuring an active co-design approach, the engagement is conducted using the following co-design tools:



Manifesto: The compilation of a Manifesto aims to support the co-design process, pinning down the overarching essential objectives for the future development of the TRU-Park site. The TRU-Park objectives align with the global urban agenda, the provincial and municipal strategies and goals, and include direct stakeholders inputs. The role of the manifesto is to guide the decision making process regarding the future of the TRU-Park. The manifesto's objectives could be unfolded in a set of programmatic and spatial principles, guiding the precinct planning and design process in detail.



Officials' resource mapping: The compilation of a matrix of proposed and on-going projects and initiatives lead by the provincial and municipal government. The exercise aims to geolocate the projects, capturing the vision behind and key information such as budget, phasing, status quo, lead department, etc. The scope of the mapping exercise is firstly to integrate all government interventions and secondly, to correctly inform the participatory and planning processes.

Stakeholders' resource mapping: The compilation of a series of 'constraints and opportunities' maps is aiming to capture the stakeholders' knowledge and perception of the site, as well as their visions and ideas for the future.

Scenarios: The construction of scenarios aims to explore possible futures for the TRU-Park site, testing the socio-spatial implications of each scenarios. Scenarios enable stakeholders to envision different possible futures, as well as offers engineers and specialists a starting point to test the relative implications. The role of the scenarios is to facilitate an inclusive and informed debate around the future of the TRU-Park site.

1.3. At what stage is the process?

The public participation process started by identifying and engaging key stakeholders in 2015. The first series of engagements were conducted with stakeholders directly affected by the proposed processes. These engagement meetings are to set a stage for an understanding of the current work, expectations and visions for TRUP. These were followed with both one on one meetings and a series of workshops with the larger groups during the course of 2015.

A series of TRU-Park stakeholders workshops have been held during the course of 2016 with the broad stakeholders group. This is the list of TRU-Park stakeholders workshops which already took place during the course of the year:

Workshop 1 - 25 February 2016: Introduction to the TRU-Park project, followed by a question and answer session.

Workshop 2 - 10 March 2016: The making of the TRU-Park Manifesto

Workshop 3 - 31 March 2016: Mapping exercise capturing the stakeholders' knowledge, through a series of maps indicating constraints and opportunities of the site.

Workshop 4 - 25 April 2016: Presentations of the different visions for the TRU-Park or parts of it, by stakeholders groups and provincial and municipal civil servants.

Workshop 5 - 12 and 19 May 2016: Presentations of the baseline studies by the professional team members.

Workshop 6 - 28 May 2016: Walkabout on the TRU-Park site, along the Liesbeek and at the SA Astronomic Observatory and the surrounding wetland, accompanied by a series of micro stories by different stakeholders and experts.

Workshop 7 - 9 June 2016: Presentations of possible future scenarios for the TRU-Park by the professional team and a stakeholder group [TRUP Association], followed by group discussions and preliminary evaluation of each scenario against the Manifesto.

Workshop 8 - 7 July and 11 August 2016: Presentations by different stakeholders, including Maitland Garden Village, Robin Trust, Western Cape Council of Nguni People, and the First Nation leader, King Khoebaha Cornelius.

Workshop 9 - 3 and 10 November 2016: Presentations of the specialist studies including: Environmental studies [Avifauna and flora, aquatic studies], heritage study, Watercourse and flood modelling, Engineering Assumptions.

The minutes taken at the above named sessions as well as accompanying presentation materials can be perused at https://www.westerncape.gov.za/general-publication/two-rivers-urban-park-–-towards-sustainable-integrated-urban-development

At this stage the public engagement with the broader TRU-Park stakeholders' group is about to be concluded with the Stakeholder Engagement workshop: The 10th TRU-Park Stakeholders Workshop provides the setting to agree on common matters described by the stakeholders and public sector, differences in opinion, and next actions that will be taken into the legislated process.

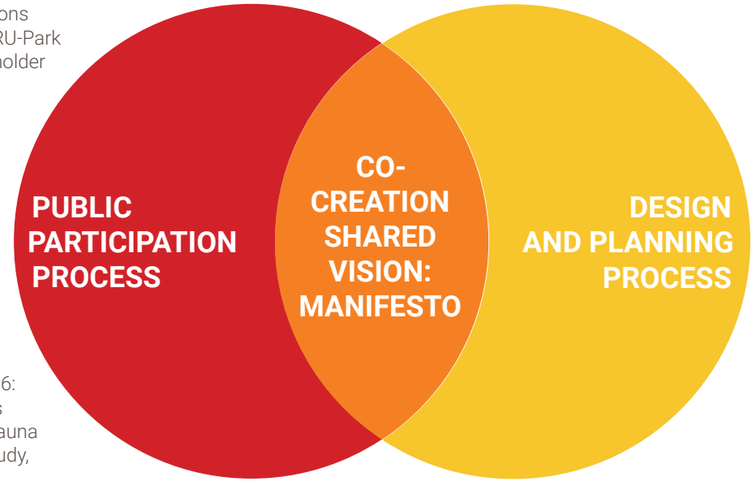


Fig.1 Role of the TRU-Park Manifesto within the design process

what was positive about the process so far.....

what was missing or negative about the process so far.....

how would you like to see the process moving forward .....

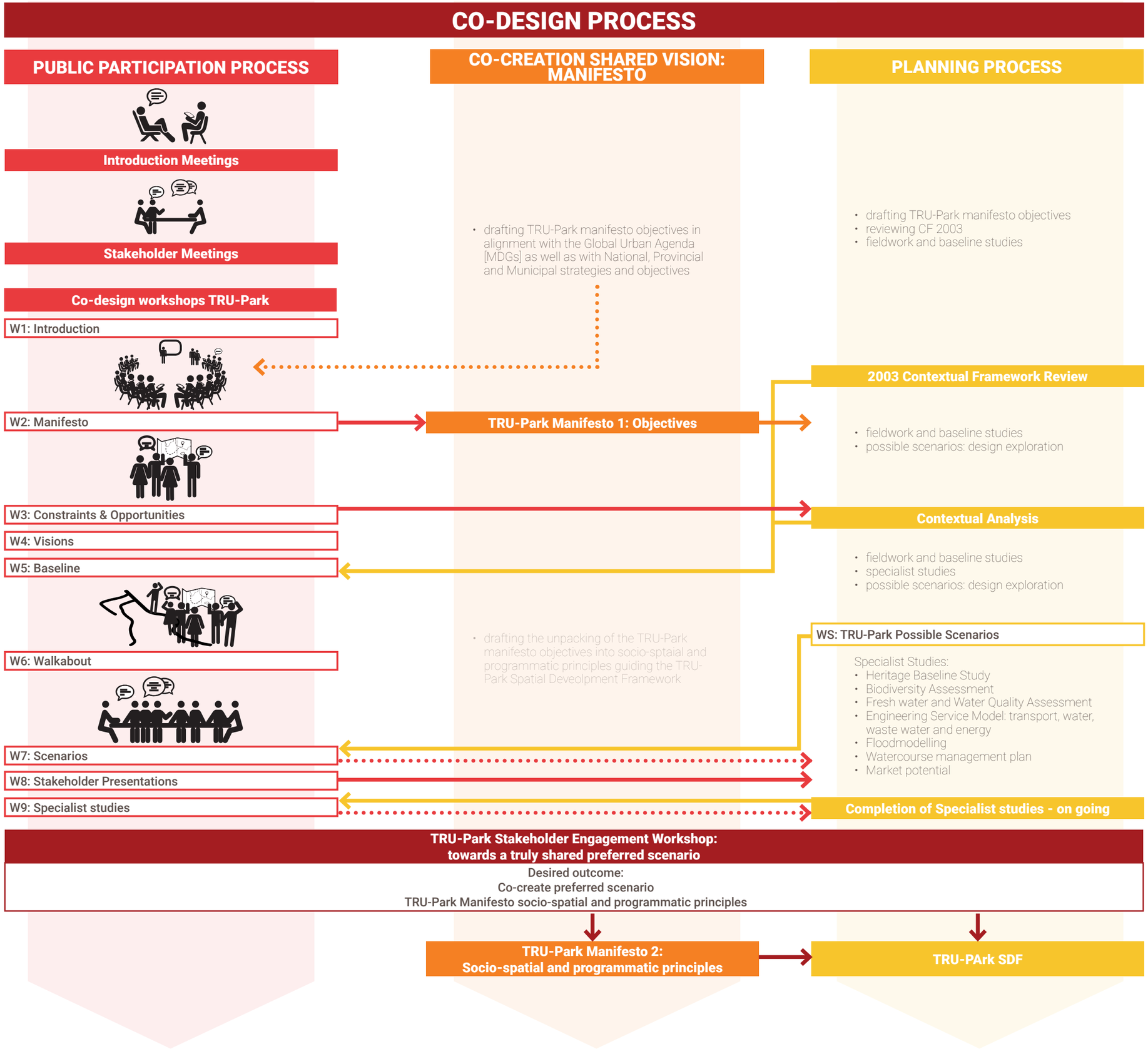


Fig.2 TRU-Park co-design process up to now

1.4. Local Spatial Development Framework

Based on the TRUP 2003 Contextual Framework Review, the City of Cape Town determined that the 2003 Contextual Framework will be updated as a Local Spatial Development Framework (LSDF) in terms of sections 13 and 18 of the Cape Town Municipal Planning By-Law (2015). The latter approach is preferable in that it allows higher order plans, such as the Table Bay District Plan, to be revised where necessary. The LSDF process is also more compatible with other procedural processes such as the Environmental Impact Assessment (EIA) and Water Use License Application (WULA) processes and enables the necessary statutory processes to run concurrently. On 07 November 2016, the Executive Mayor of the City of Cape Town approved the initiation of the TRUP LSDF process.

Package of Plan

- **TRU-Park Contextual Framework**
- **TRU-Park Development Framework**
- **TRU-Park Precinct Plans**
- **TRU-Park Site Development Plan**

Local Spatial Development Framework [LASDF]
TRUP Process Plan 2017

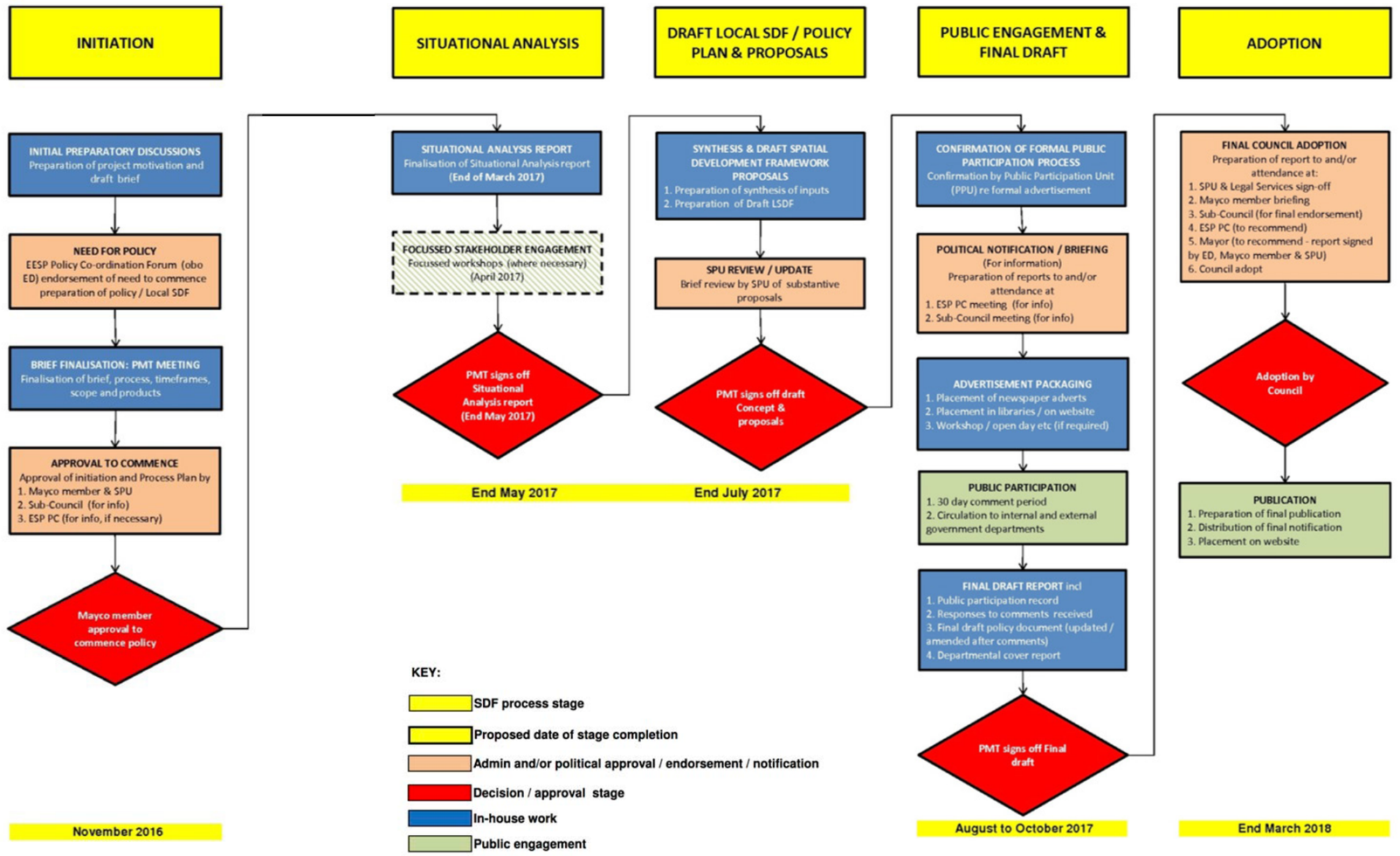


Fig.3 TRU-Park change in planning process

1.5. Interpretative contextual mapping

The design approach adopted by the design team is interactive and reiterative, it relies upon informing the design process with an understanding of the site which is embedded in both quantitative and qualitative knowledge. The strategies utilised to obtain these understandings relied upon professional consultation as well as consultation and active participation with the stakeholders. The emphasis of the information gathering was on the specificity of the information, with the intention being to understand the study area's specific site conditions within the context of the catchment and the metropolitan areas, with the intention of understanding its potential role as a facilitator of ecological and social cohesion within the City. This necessitated strategies in respect of the gathering and proofing of information.

The initial contextual mapping and analysis relied upon desk top information for the Natural, Urban and Social Systems, which were ground-truthed (Specialist Studies) and in some cases amended following the Specialist Studies. Which in respect of the Flood Modelling, River Corridor Study, Biodiversity and Fresh Water Studies required detailed assessment and ground truthing.

The intention of the Interpretive Maps is to utilise the consolidation of the information gathered as a lens through which to begin to understand the site, it also privileges the idea of interrelationships between various understandings and occupations of the site. The intention was to design a way of collating the information that reveals the interrelationships between systems within the Study area and highlights the concerns and considerations prevalent on the site. These Interpretive maps were used to tease out the intrinsic natural and made characteristics of the site, the inhibitors and blockages to ecological and social cohesion as well as the possible futures for the site.

The key strategies that were identified through this process were the need to conserve, connect and activate aspects of the site for both the ecological and social betterment of the metropolitan area and the site area in particular (RHDHV comment: This by default includes strict control and limitations imposed on "no go" areas such as Critical Biodiversity Areas).

The design process testing these ideas is still in its initial stages:

a. The design proposals have been workshopped by the professional team

b. The initial proposals were workshopped with CoCT, the current proposals will be reviewed by the CoCT as part of the GCMP document Draft review.

c. These proposals require Public Participation. Which will further inform the refinement of the Landscape Master Plan.

d. Future consideration of the precinct level planning will contribute to a site specific understanding of the thresholds between the precincts and the Green Corridor.

The design process is understood as a reiterative process which will undergo constant refinement as more particular understandings of TRUP at the scale of the site and catchment scale within Metropolitan Cape Town are gathered and interpreted.

2. TRU-Park Manifesto

The Two Rivers Urban Park (TRU-Park) and its associated landholdings offer a unique opportunity for the City of Cape Town. This strategically located site has many attributes and unique qualities that can help to "heal the city" and give hope to its people. TRU-Park is located at a strategic confluence of important ecological elements and urban corridors. The surrounding communities are culturally diverse and live in different socio-economic conditions.

TRU-Park is an ecological asset of great and unique value, enriched by multiple heritage and cultural narratives. Its ecological integrity is currently heavily compromised by large infrastructural barriers and uncontrolled pollution from its urban surroundings. TRU-Park has the potential of becoming an ecologically thriving landscape, celebrating its rich cultural diversity.

TRU-Park offers the opportunity to provide the surrounding communities with access to resources, to improve the freedom of movement across and around the site through affordable and sustainable modes of transport as well as the opportunity to celebrate different cultural narratives. These opportunities could begin to re-dress the socio-spatial legacy of apartheid.

TRU-Park could become a showcase of sustainable development by bridging the social divide, re-establishing the ecological integrity. As a distinctive re-generation area it affords the prospect to create a precinct that is diverse and yet socially inclusive. It offers the possibility to provide an inspiring and welcoming space within the city, for integrated and sustainable communities as much as for interested partners and investors.

The role of the manifesto is to guide the decision making process regarding TRU-Park. It is a fundamental tool in reinforcing the co-design process. It aims to collect inputs from the interested stakeholders and the WCG and CoCT custodians of the site.

With this envisaged development of the TRUP, 10 fundamental objectives has been identified informing the various principles by which the TRUP project is to be carried out. Public participant processes, policy decision making, management systems, urban design, water engineering and landscape design principles should all be guided by these overarching interests. To ensure success in the way forward, the application of these objectives should be regularly monitored. On this basis, the TRU-Park project can make a meaningful contribution towards an alternative, exciting and sustainable future

1 To develop a **safe metropolitan urban park** based on sustainable principles and responsible management practices that is founded on a partnership between local communities, different tiers of government and other partners willing to invest resources. To design the park as a truly shared open space, triggering social inclusion; a new metropolitan destination accommodating tourism and enhancing ecological awareness.

2 To restore and preserve the **ecological integrity** of the site as a special physical and visual amenity. To limit new building coverage and avoid building within the flood plain, to make provision for water flooding, water cleansing and water storage in order to enhance the recreational quality and environmental value of the site.

3 To embrace a **sustainable environmental approach** that seeks to protect the natural qualities of the site and develop the precinct in a manner that respects the Earth's resources as well as natural environments, and that is in keeping with national and international best practices; to re-activate landscape for water cleansing, regulating air quality and urban food production.

4 To promote the use of **sustainable modes of transport** [walking, cycling, public transport, etc…]; to discourage the dependency on private vehicular movement, to encourage the use of public transport, as well as support and encourage non-motorised transport and pedestrian movement.

5 To provide **dense mixed-use, mixed tenure urban environment**, where appropriate, associated with the Park that is holistic and sustainable. Where-in people can safely live, work and play. In particular, to make provision for medium density affordable housing. To strive towards building a vibrant, safe, local resident community in which cultural diversity and tolerance could flourish.

6 To develop **funding and local economic opportunities** geared towards sustainable development. These are geared towards community, public and private partnerships as well as the involvement of institutional investors. To mobilise new investments, create jobs and ensure that a significant component of the business premises are affordable for small and micro-enterprises, enhancing human capital and supporting social entrepreneurship.

7 To align the development and the preservation with **clear management, administrative and institutional systems**. To bring government and public services closer to the people, and where required, to reform legislation. To develop and find new ways and forms of entrepreneurship to ensure sustainability and sustain the quality of the public spaces in the TRU-Park through good urban and environmentally appropriate management.

8 To develop TRUP as an **integrative space** that responds to culture, heritage and memory of the site – a place that joins together this region of the city and its local communities, rather than continuing to serve as a 'barrier space' and therefore, assists in undoing apartheid spatial planning and attending to the needs of the current and future communities. This is to be implemented with sensitivity to the heritage of the site and be inclusive of the diverse cultural characteristics.

9 To establish a **social partnership** that can form the basis of cooperation between the various stakeholders, which can address the inequalities of the past, include the marginalised sectors of society, prioritise public rather than private interest as well as help build viable enterprises; to enhance existing communities [e.g. Maitland Garden Village], organisations and programmes within the TRU-Park area.

10 To develop, where possible, **alternative systems of technology** - resource efficient sustainable technologies – that are viable as well as financially feasible and which could demonstrate alternative modes of urban living. TRU-Park as showcase of sustainable living [zero waste, passive design, renewable energy, local materials, climatic responsive design, …].

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3. Possible Scenarios

The possible scenarios were presented to the stakeholder group as part of the public participation process, during the 7th TRU-Park workshop on the 9th of June 2016.

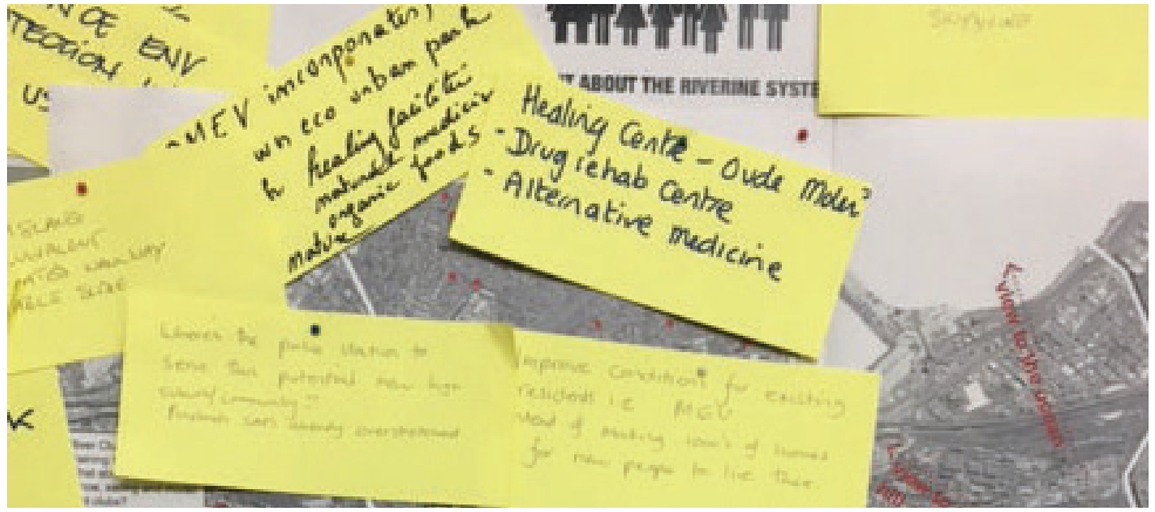
The scenarios 1 and 2 as well as A and B have been developed by the professional team in consultation with input by the client and the stakeholders as part of the Public Participation process. Scenario C was brought forward by selected members of the TRUP Association. Scenarios A, B, C were presented to the stakeholder group for debate as part of workshop number 07 of the public participation process.

The construction of scenarios aims to explore possible futures for the TRU-Park site, testing the socio-spatial implications of each scenarios. Scenarios enable stakeholders to envision different possible futures, as well as offers engineers and specialists a starting point to test the relative implications. The role of the scenarios is to facilitate an inclusive and informed debate around the future of the TRU-Park site.

These possible scenarios and the manifesto are work in progress, they are intended as tools of co-design. In this respect, they are changing along with the unfolding of the public participation process.

These scenarios are not a proposal for site development. They offer merely the opportunity to test and discuss different ideas for the site, serving the purpose of having an open and inclusive debate in constructing a shared vision.

Future proposals will derive out from the shared preferred scenario at a later stage along the process.



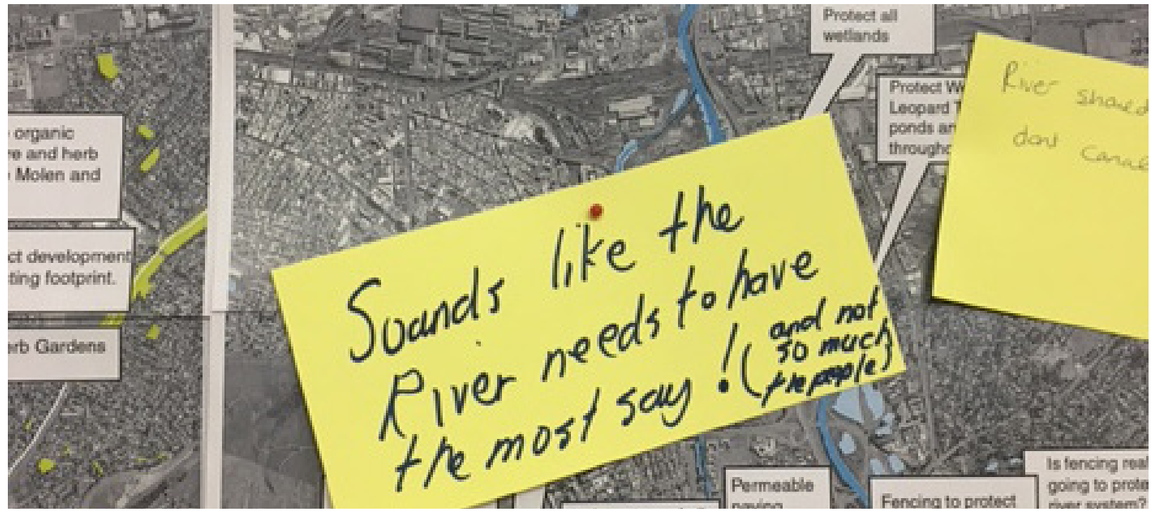


Fig.4 Stakeholders mapping constraints and opportunities during the 5thTRU-Park Workshop

The stakeholders' resource mapping reflect upon several themes such as open spaces, riverine and natural systems, mobility, social infrastructure, future development, etc.

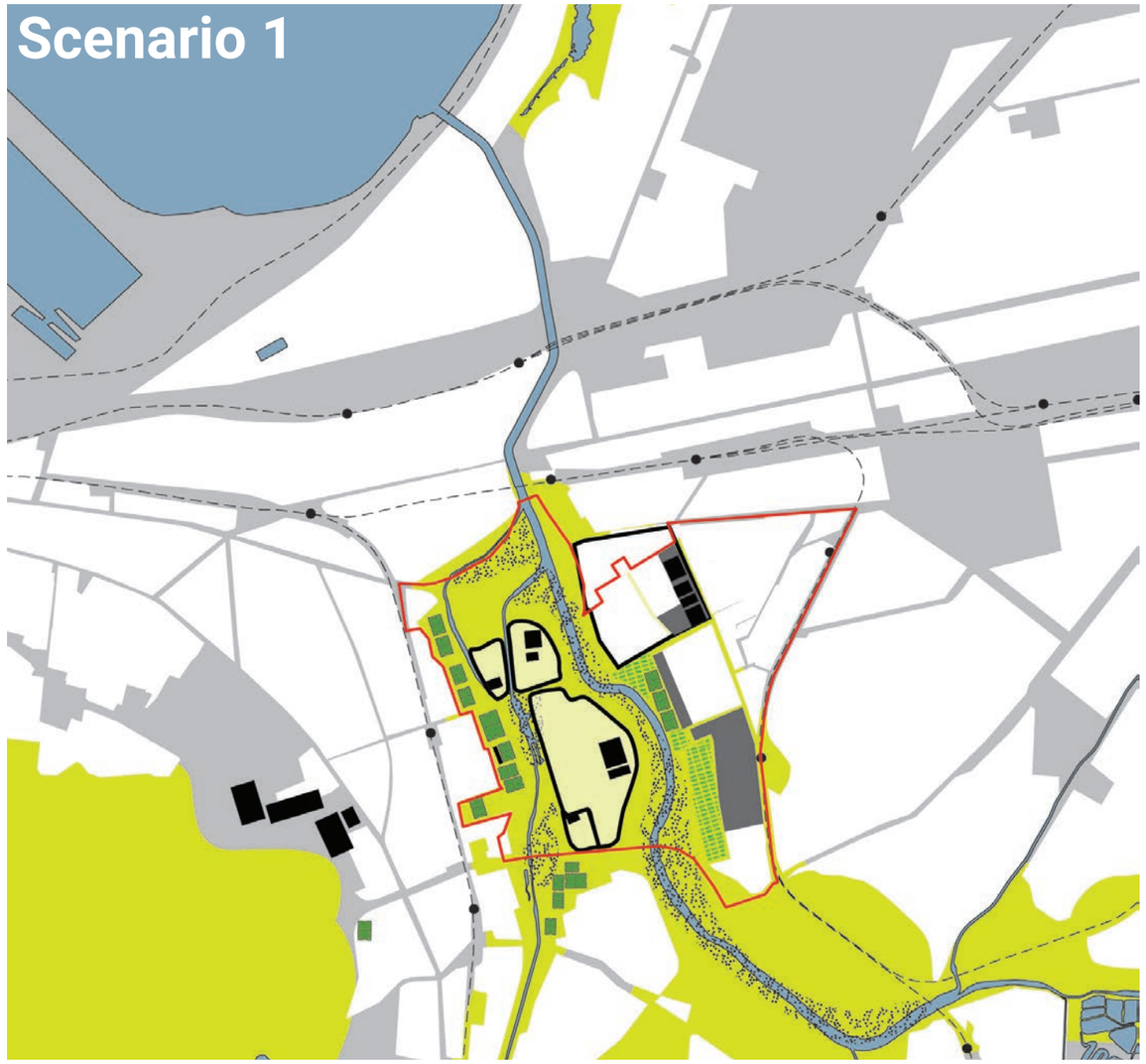
Along the mapping process, a series of non-negotiable objectives emerged. These non-negotiables have been taken into account in the scenarios exploration. These objectives are described below.

What ...if TRU-Park ...

- Protects the integrity of the ecological systems - green lung.
- Enables and enhances bio-diversity corridors.
- Enables urban agriculture.
- Balances environmental and recreational uses.
- Enhances the perception and the experience of the landscape.
- Clean the water of the rivers through a broader water purification strategy.
- Protect the integrity of the ecological system.
- Enabling the wetlands.
- Naturalising the river courses [getting ride of concrete hard edges along the river].
- Survey and protect fauna and flora.
- Enabling recreational use of the rivers.
- Is a pedestrian and public transport based area [reduced car/no car].
- Promotes the use of public transport through an extensive and strategic IRT and NMT network.
- Provides strategic [NMT] pedestrian and cycle links and bridges [re-introduce the bridge over Black river].
- Mitigate the impact of infrastructural and natural barriers across the site.
- Is an open public amenity accessible to all.
- Has a wide variety of social infrastructure.
- Ensures the continued functioning of existing activities.
- Protects and enhances the heritage landmarks and views.
- Identifies spaces for ceremonies and rituals.
- Celebrates the diverse cultural narratives associated with the site.
- Extends to the sea and to Langa
- Includes the development of Alexandra Rd as an 'activity street'.
- Includes the MGV development strategy.

With regard to the proposed future developments, such as the River Club, CHTP, SKA and Berkley extension, the stakeholders' response has been summaries as followed:

- The 130 000 sqm development proposed by River Club is totally unacceptable.
- CHTP should find another site outside the Oude Molen area.
- SKA could take place between Valkenberg and the Observatory.
- Berkley extension should take place, avoiding the green area as much as possible.

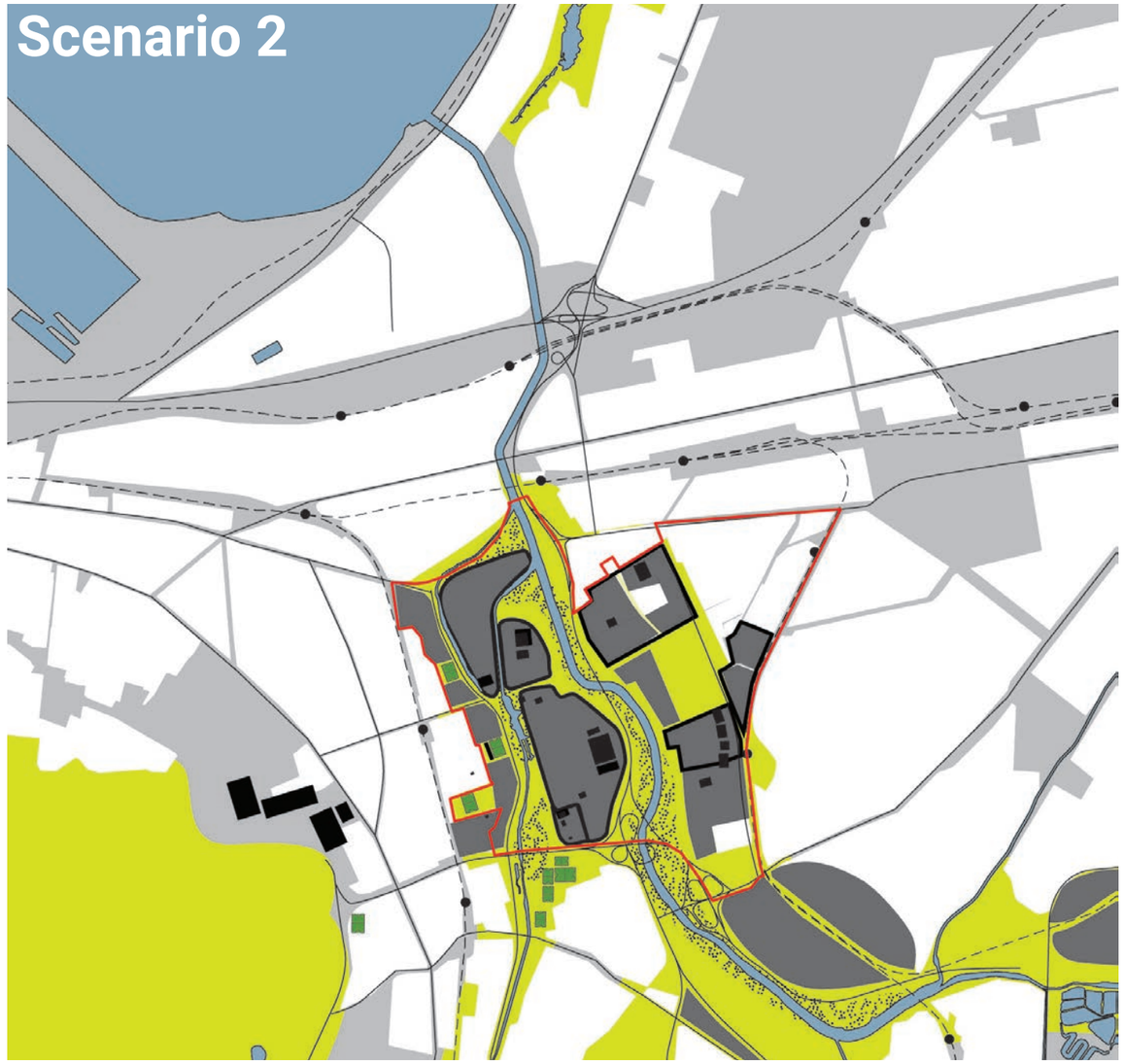


What if...2003 contextual framework remains in place.

This scenario follows the planning proposals contained in the 2003 TRU-Park Contextual Framework. Development is limited to areas outside of the 1: 50 year floodplain, wetlands, buffer areas and river system. The core areas of Valkenberg Hospital (west of the Black River) and Alexandra Hospital are retained with the remainder being available for development. Investment in the park is proposed in terms of the Environmental Management Plan administered by the TRU-Park Association.

IMPLICATIONS:

- Fragmented collection of spaces
- River course unchanged
- Introverted natural space
- Limited access to the river
- Retention of historic fabric
- Cost of park maintenance challenging
- Development is limited and does not address social potential of Park
- Intervention does not address ecological and social fragmentation
- Limited opportunities for tourism
- Does not promote the use of NMT and public transport

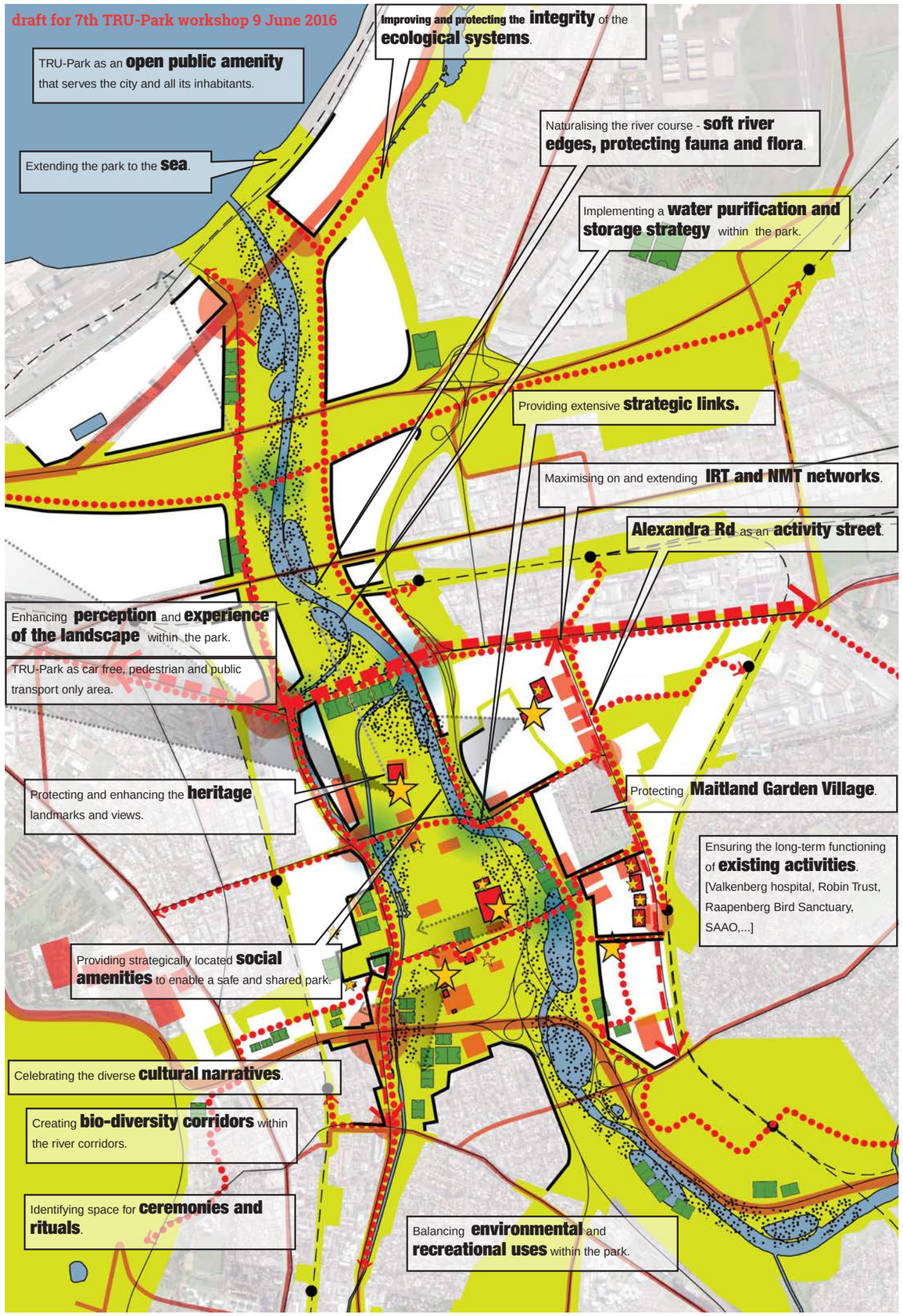


What if...a market-driven approach takes over in the absence of a coherent framework.

This scenario is a reflection of a realistic market-driven investment pattern on privately and publicly owned sites. It is based on individual proposals for the TRU-Park site, developed on the principle of highest and best use. The scenario includes development proposals for the Oude Molen site, the River Club and assumed development of the Golf Driving Range adjacent to Maitland Garden Village and the old Abattoir. It also includes development of a new Headquarters for SKA and the Cape Health Technology Park within the boundaries of the site. In addition, it acknowledges the upgrade and expansion of Valkenberg Hospital. Portions of the Alexandra Institute not required for hospital purposes, are also expected to be developed and therefore included in the scenario

IMPLICATIONS:

- Park as leftover space
- Increasing fragmentation of open spaces
- Introvert development
- Lost opportunity to create major public destination
- Limited access to the river
- Development is limited and does not address social potential of Park
- Intervention does not address ecological and social fragmentation
- Market feasibility study shows a very slow uptake of commercial and residential development. This may result in the failure of the park in the short to medium term
- Private development could precede public sector driven development and limit uptake of the latter.
- The site competes with other strategically located public owned sites in close proximity [eg. Conradie]
- Limited opportunities for tourism
- Does not promote the use of NMT and public transport



What if ...TRU-Park is part of a continuous riverine park reconnecting the city to the coastline. The linear ecological corridor reaches the bay and re-establishes the lost wetland estuary. TRU-Park's floodplain is re-moulded to strengthen the continuity and integrity of the riverine system as well as to create safe developable space along its edges. The landscape of the park is contained and clearly defined within the cityscape. The edges of this park are the focus of intense activity.

The TRU-Park ecological riverine corridor celebrates the fresh water reaching the salt water. Giving more space to water, the linear park re-establishes a lost ecotone by inserting a salt water wetland.

The non-motorised transport network supports the edge of the park, enhancing the experience of riding and walking across the city, as well as supporting movement to the coastline. Vehicular routes lightly fly above the park. Public transport stops are located along the edges and reinforce entry points to the park.

The Park edges are bulked high maximizing the visual and amenity value of the wetlands. Future developments close to the wetland estuary aim to mitigate the impact of large infrastructure at certain points, and provide passive surveillance by activating the space. Development of a quality public edge along the estuary could create value to encourage the private sector to invest. A system of social infrastructure elements located sensitively within the wetlands could attract people from different neighbourhoods, turning the park into a place of shared experience and social engagement.

The riverine system acts as a recreational amenity and offers visual relief as well as a sponge and filter which absorbs and cleans the storm water generated from the adjacent developments.

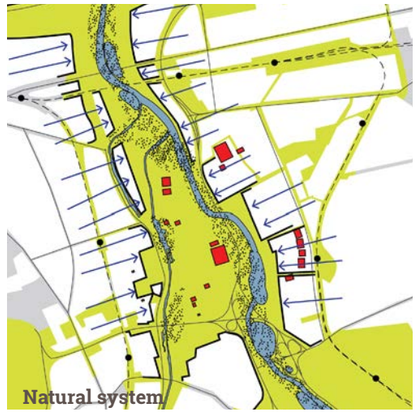
Scenario A: Urban Wetland

This scenario explores:

- re-moulding topography to widen the riverine corridor and ensure the integrity of the riverine system,
- establishing the riverine system as 'sponge' which absorbs and filters the surrounding storm water,
- re-establishing the lost wetland estuary,
- mitigating the impact of large infrastructure to restore the continuity of the riverine system and
- removing part of the railway line between Cape Town station and Kentemade station.

please write comments, issues and possible ideas you want to add and/or highlight:

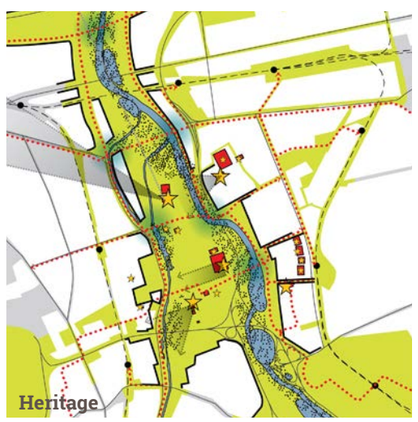
What if the Park ...
- is a continuously wide open space.
- Is highly accessible via NMT routes and public transport stops on the edges of the park.
- Topography is remoulded to guarantee safe land for future urban development
- Public facilities, sport and recreation are distributed within the park.
- Has the capacity to facilitate a variety of landscape uses, for example urban agriculture, wetlands, meadows, orchards, etc
- Design recognises the different characteristics of the two river systems and utilises these differences to create an environment that is responsive to its context.

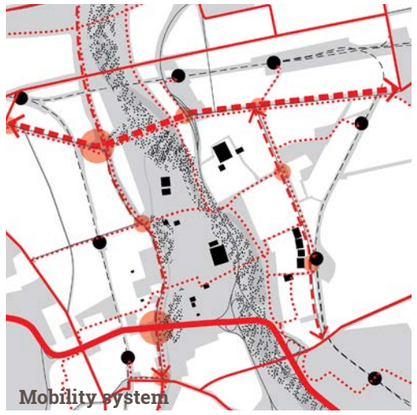

Natural system

What if the riverine system ...
- Is a continuously wide biodiversity corridor reaching the ocean.
- Connects Table mountain and the lagoon system on the North.
- Widens and opens its mouth to the sea.
- Is predominantly a naturalised open space, with only soft rivers' edges.
- Has no canalisation of water courses, although it could contain detention basins if required and weirs might be needed to manage the relationship between the salt and fresh water.
- Flood plane is re-moulded to provide space for water and future development.
- Could hold a wetland purification system, forming an integral part of the water cleansing process with purification starting at the WWTW's. Once cleaned the water could be stored in series of retention ponds along their rivers' courses.
- Storm water from future development and existing built environment could be collected, filtered and stored along the rivers.

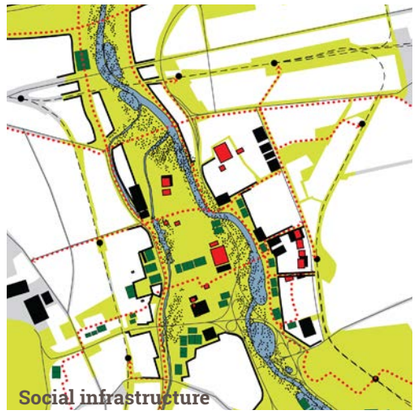
What if access and movement ...
- TRUP-Park is designed as an interchange allowing people from across the metro to change between modes and services on route to the CBD and/or the northern corridor.
- Included the construction and implementation of a new IRT trunk route on Berkley Rd ext. that could feed a Liesbeek Parkway feeder service
- Included the extension of Liesbeek Parkway as an IRT feeder route towards Marine Drive and a new feeder service along Alexandra Rd.
- Included a new IRT feeder service on Liesbeek Parkway allowing users of the metro wide IRT services on the N2 to transfer and access the Park
- Included two new PT gateways, one on the N2 as it crosses Liesbeek Parkway and one on the western end of the new Berkley Rd extension, to enable transfers and interchange between services.
- Provided PT stops along Liesbeek Parkway aligning with the NMT routes crossing the Park.

What if heritage ...
- is experienced through the site.
- Focussed on memorialization of estuary landscape.
- Could be celebrated through sensitive landscaping, recognising the seasonal character of the past landscape.
- Buildings could be 'adapted and reused' to form an integral part of the system of social infrastructure.
- Attention could be dedicated to making the intangible heritage of the site visible, through memorialization and landscape interventions.
- Elements could be easily accessible through the NMT network.
- Bridges and river crossings could reflect the role of site as an historic frontier.
- Views are respected and heritage buildings are embraced as crucial landmarks within the park.

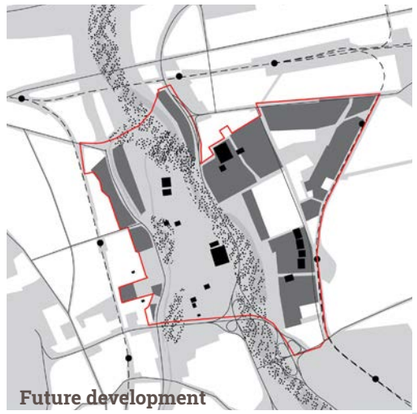

Heritage


Mobility system

What if social infrastructure ...
- such as sports, recreation and other facilities were located within the wetland estuary.
- Could activate the NMT routes within the park, providing passive surveillance.
- Could attract people from surrounding neighbourhoods and encourage social interaction around a common set of facilities.

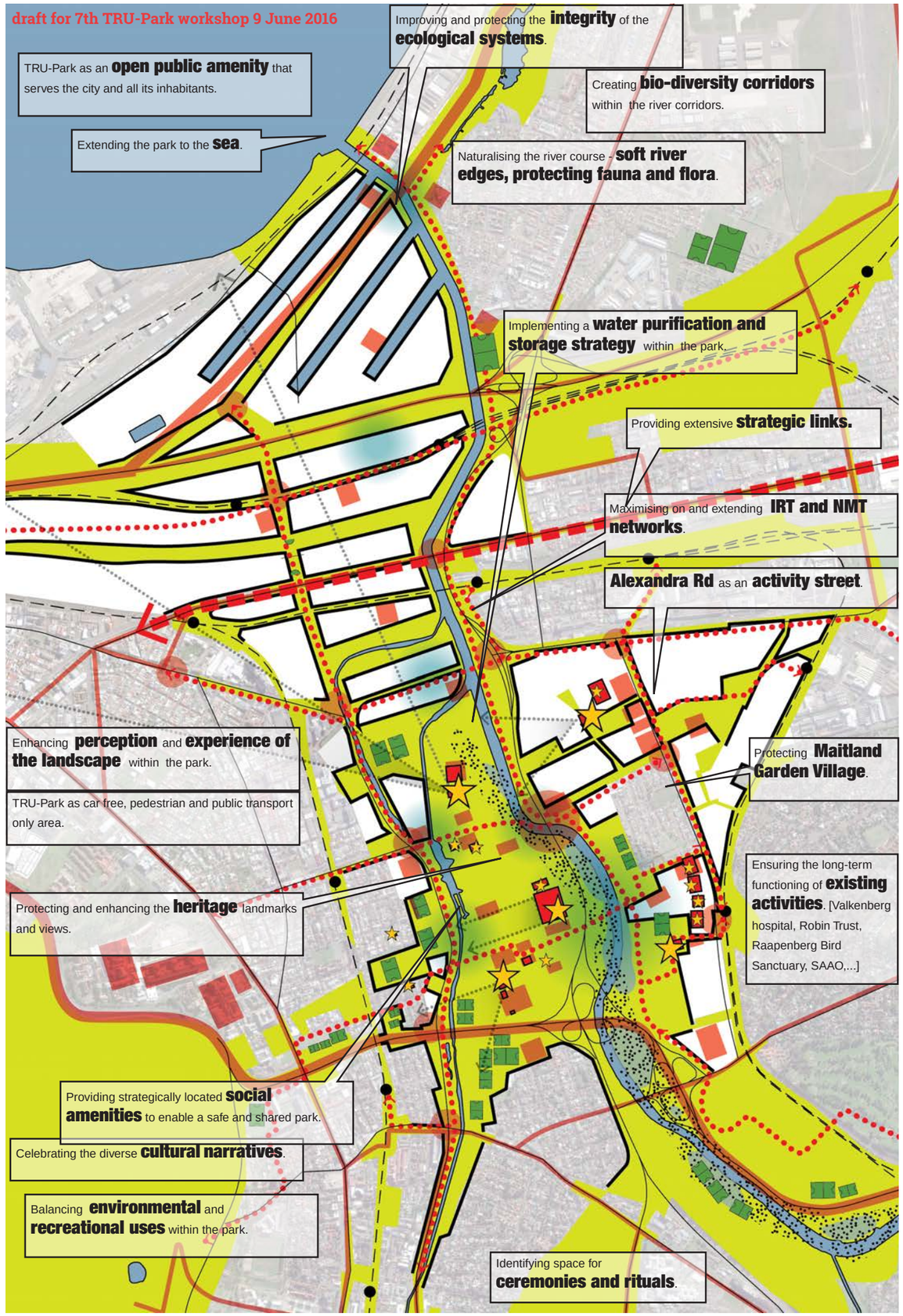

Social infrastructure

What if future development ...
- is compact and dense along the edges of TRU-Park, providing passive surveillance and enabling a direct interaction with the seasonal landscape.
- Is compact and mixed use whilst providing public service orientated development around gateway points (intersection of Station Rd with Liesbeek Parkway and Alexandra Rd respectively)
- Involves a dense mixed use urban edge including the western edge of the River Club, looking over the Liesbeek River valley.
- Includes the construction of mixed use edge along Liesbeek Parkway overlooking the water
- Involves a mixed use hub on Oude Molen including an eco-village, maximising on access to Pinelands Station and IRT services on Alexandra Rd
- Includes a mixed use development on Alexandra Hospital site overlooking the river and the Observatory.
- Provides a dense live-work-play environment within Ndabeni Triangle structured around a set of formal social and recreational facilities that bring different occupants of the broader site together.
- Includes small Islands of development and special places within the wetlands.
- Includes a compact mixed use environment in Paarden Island, maximising on access to the IRT route and a positive interface with the estuary type environment.
- Counts an approximate development footprint of 93ha, resulting in a bulk of approximately 1 023 000m² (FF of 1.1).


Future development

please write comments, issues and possible ideas you want to add and/or highlight:

please map comments, issues and possible ideas you want to add and/or highlight:



What if ...TRU-Park extended into its urban surroundings, to intertwine the urban and natural worlds. The open green fingers create a transition zone to reduce the impact of the surroundings on the riverine system by focusing movement and water flows to a set of strategically located linear green open spaces. Landscape and cityscape are intertwined enabling a new relationship between the built and natural to be conceptualised.

The urban and natural systems are not seen as separated, but rather as a mesh, complementing and supporting each other.

The natural fingers contribute to the purification of storm water and grey water before it reaches the riverine wetland system. A highly permeable NMT network creates a mesh for movement that relates to the green systems & parkland.

The edges of the park push forward at points to allow development close to the water, while retracting at other points to allow the landscape to permeate into the urban fabric.

The system of social infrastructure elements distributed within the park and green fingers provide attractions for people from the different surrounding neighbourhoods, turning the green open space network into a truly shared domain and one that facilitates social cohesion.

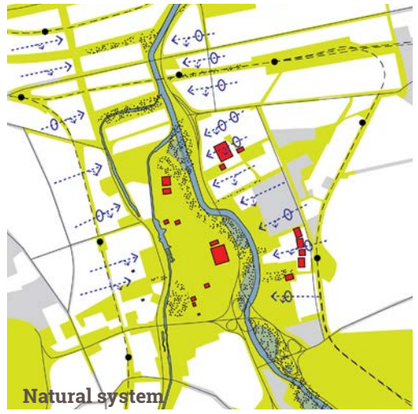
Scenario B: Extended Park

This scenario explores:

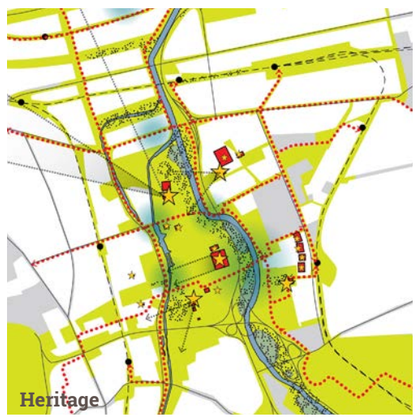
- The concept of a more fluid boundary through which local communities are empowered to take care of the extended Park.
- Natural fingers extend into the urban environment providing locally significant natural goods and services (eg. filtering, cleaning and replenishing of water sources)
- The development of a vertically dense urban environment around a network of linear green open spaces.
- The development of Paarden Island as a marina, mimicking the concept of bringing nature into development areas.
- The concept of creating a navigable Salt River.

please write comments, issues and possible ideas you want to add and/or highlight:

What if the Park ...
- is seen as an integrated part of the urban landscape.
- Extends as a green system, each with a distinctive character. The fingers serve as containers of different social programs.
- Public facilities, sports and recreation are distributed within the green riverine system as well as strategically located within the urban development in combination with the filtration systems.

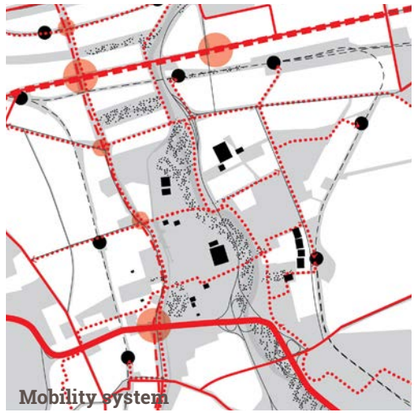

Natural system

What if the riverine system ...
- Is a continuous bio-diversity corridor extending into the built surroundings via a greened filtration system
- Connects Table Mountain and the lagoon in the North.
- Extends into the built environment through a series of constructed green fingers which could have distinctive landscape characters.
- Is extended by increasing the porousity of the urban fabric. The storm water captured from the surroundings could be filtered though the constructed green fingers and paired with a water percolation strategy, including swales, water filtering and constructed wetlands. The permeability of the soil at strategic points within the future development and in the existing built environment could facilitate filtration of the storm into the aquifer before discharging into the riverine wetland system
- Flood plane is re-moulded to provide space for water storage, detention and for future development.
- Flood mitigation will be facilitated within the riverine and development systems.


Heritage

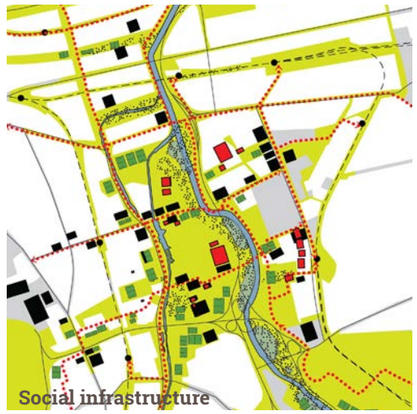
What if access and movement ...
- includes two new NMT links, namely Berkley Rd and Station Rd ext. to connect the western and eastern banks of the river corridor and to ensure easy access to the existing rail stations.
- Proposes the prioritization of IRT routes on the N2, N1 and Voortrekker Rd to ensure people from across the metro can access the site easily.
- Proposes a new NMT network across the site and along the main north south axis such as Liesbeek Parkway and Alexandra Rd.
- Proposes Liesbeek Parkway as a high density, high volume bus feeder and NMT route with gateways where it connects with a series of high volume NMT cross links taking pedestrians and cyclists over the M5 and the rivers towards Alexandra Road.
- Proposes that Alexandra Road be designed as a high volume NMT route that links the rail stations east of the river corridor to each other and the finer grained NMT network.
- Proposes the extension of Liesbeek Parkway as a high volume NMT connector route to Marine Drive in the long term. This would address the lack of continuity between the site and the northern corridor.

What if heritage ...
- is experienced through the site.
- Focussed on the TRU-Park site as a place of engagement as opposed to conflict and separation.
- Could be celebrated through sensitive landscaping, recognising the seasonal character of the past landscape.
- Buildings could be 'adapted and reused' to form an integral part of the system of social infrastructure.
- Attention could be dedicated to making the intangible heritage of the site visible, through memorialization and landscape interventions.
- Elements could be easily accessible through the NMT network.
- Bridges and river crossings could reflect the role of site as an historic frontier.
- Views are respected and heritage

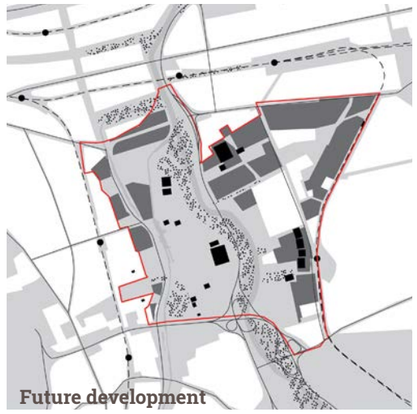

Mobility system

buildings are embraced as crucial landmarks within the park.

What if social infrastructure ...
- such as sports, recreation and other facilities gravitated towards the green fingers and edges of the park.
- Is located along the key NMT routes (green fingers and edges of the river), activating the spaces and providing passive surveillance.
- Is integrated with other land uses around a network of local public open spaces.


Social infrastructure

What if future development ...
- is vertical mixed use development in the TRU-Park surrounds, providing space for nature to extend beyond the riverine system
- Is fragmented with vertical development opportunities along the river accommodating public and commercial activities that can provide extended hours of operation and surveillance over the river corridor as the core of the TRU-Park
- Is a dense mixed use active urban edge looking over the Liesbeek River valley and Liesbeek Parkway as a high volume NMT corridor.
- Includes the redevelopment of the Malta Rd sportsfields and other fields besides Hartleyvale and the swimming pool to create a more positive interface to Observatory.
- Includes development of portions of the River Club which frame an open recreational precinct and define one of the green fingers
- Provides space for future development between N1 and Berkley road.
- Involves a mixed use hub on Oude Molen including an eco-village that maximises on access to Pinelands Station and incorporates areas of urban agriculture away from the river
- Includes a mixed use development on Alexandra Hospital site overlooking the river and the Observatory.
- Involves a dense live-work-play environment within Ndabeni Triangle structured around a set of compact green open spaces and water bodies that connect with the river below.


Future development

- Includes a marina type environment within the present day Paarden Island providing a dense urban mixed use environment maximising access to the water's edge. The blue fingers of the marina can potentially assist in flooding mitigation and provide a venue for recreational and economic activities such as oyster farming, for example.
- Counts an approximate development footprint of 88ha, resulting in a bulk of approximately 968 000m² (FF of 1.1).

please write comments, issues and possible ideas you want to add and/or highlight:

please map comments, issues and possible ideas you want to add and/or highlight:

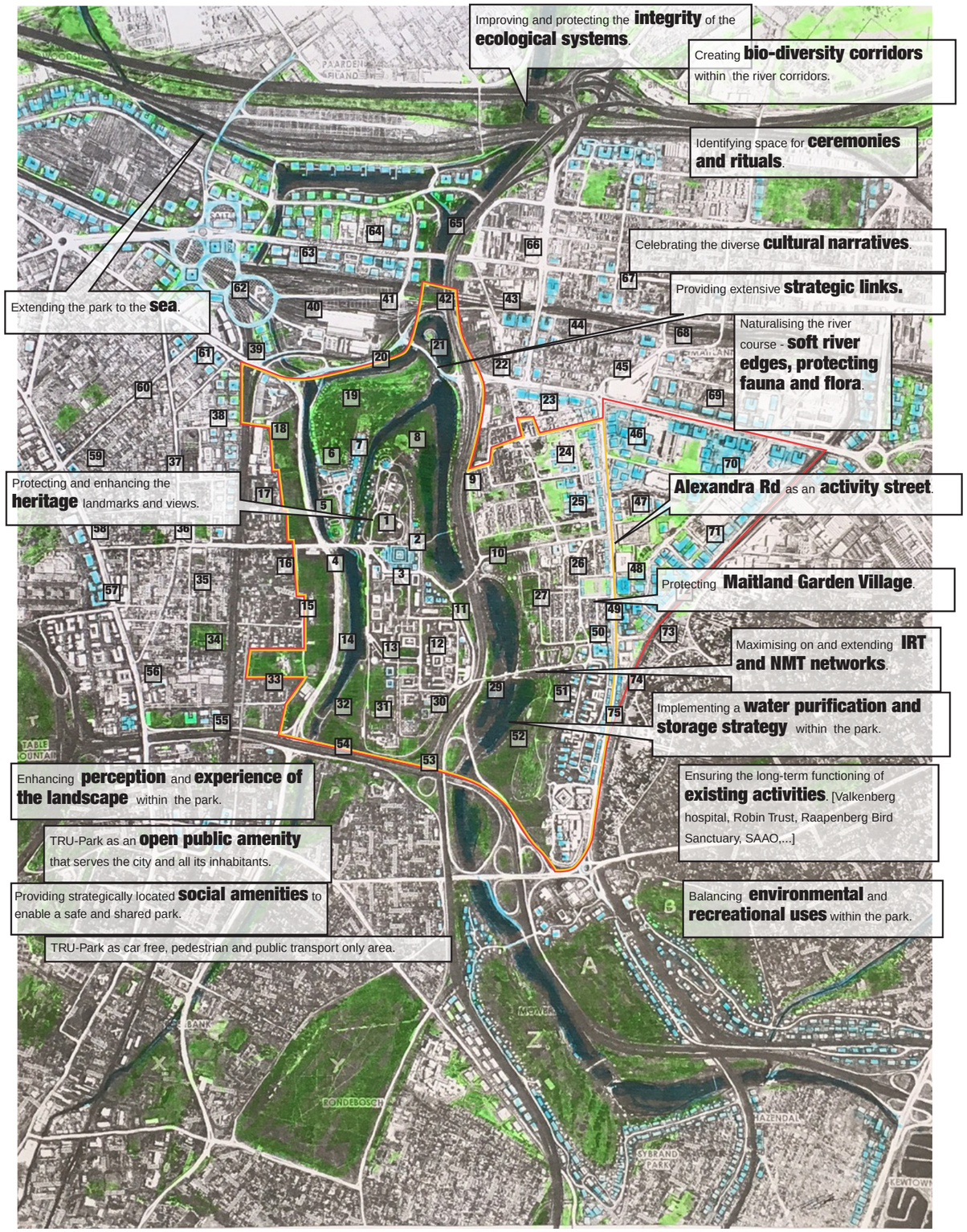


Fig.5 Scenario C: Preserved Park designed by Marc Turok in collaboration with the Two Rivers Urban Park Association

What if ...

TRU-Park is recognised and upheld as the last large green natural area close to the city. The continuity of the natural system is re-established, by preserving all green open areas within the park and particularly the floodplain. The park extends with-in the city along the water system, offering recreational facilities such as picnic areas, allowing the public to enjoy the green space and natural wetlands with its abundant bird life.

Scenario C proposes development mainly around the TRU-Park green space, not inside the floodplain!

It is also proposed that the river be extended to the north-west bringing life and greenery along its banks, and high density living including social housing could be well located near to places of employment. The city is linked to the park through a thorough movement system, including cycling, walking and riding paths. Future development is occurring all around the park, with the exception of few buildings within the park.

The scenario accommodates approximately more than 1.4mil m2 bulk, spread over a broad area mainly outside around the outside of the park and almost nothing within the floodplain. This will in time be an incentive to even greater growth in a sustainable and efficient way.

Scenario C: Preserved Park

This scenario explores:

- Minimising any additional development within the park and almost nothing in the floodplain.
- Spending money on housing and toilets in the existing run down informal settlements next to the Black river. This will reduce water pollution and improve the living conditions where it is most needed.
- Ndabeni can be developed as a work-live-play area. It could become the best-practice model of sustainable development, applying all the latest green technology.
- Looks at alternative potential work-live-play development areas in Maitland, Salt River, Woodstock, Culemborg and along Voortrekker Road.
- Stimulating local job creation opportunities.

please write comments, issues and possible ideas you want to add and/or highlight:

1. SAAO as preserved heritage asset.
2. Existing foot bridge over Black River and wetland.
3. Proposed site for S K A.
4. Improved intersection and access bridge with direct river flowing and safe NMTpath. Improved non silting weir.
5. River and edges cleaned and planted appropriately. New Green Learning Centre, Gym, extra parking and multi sports field.
6. Existing River Club sports facilities with restaurants, sports bars, sound proof dance clubs, conference facilities.
7. State of the art Tourist Hotel & self-catering accommodation, screened on east from wind.
8. Bird Sanctuary and preserved heritage site with careful upgraded screening, Circular Tea Room & extra accommodation on west.
9. M5 motorway noise & Alexandra Hospital with edge screening. Improve access to Heritage Mill and to cross over to Observatory.
10. New 'NMT' bridge built from OBS to MGV. One-way car access is available. Water edge has shared Traditional Ceremony Facility.
11. Valkenberg fence makes space for communal facilities and access road around the TRUP site with minimal restriction if any.
12. Recently renovated beautiful building to have more normalised access and security. Compact use of site.
13. New hospital entrance to take an angular line off the Liesbeek access road. The shift of axis is essential. Viewing tower installed.
14. The level of Liesbeek River to be raised slightly and banks made safe against erosion. Plant fynbos not grass along edge
15. The existing Hockey Stadium to allow NMT cross access to river from Lower Wrensch Road. New Outdoor Gym at river.
16. Filter storm water entering river. MyCity bus stop at Hartleyvale's Soccer Stadium with new matching white roof.
17. Impact of the OBS Business Park on TRUP to be looked at and traffic solutions to be considered.
18. Existing green fields protected from development and facilitating best use and open community access with friendly rules.
19. The River Club Flood Plain kept as open green space as heritage frontier dream space with no road or development cutting it up.
20. New link Malta-Berkley to be located on north of widened navigable river. New circular south to east rail line system.
21. Spiral Memorial sacred site to visit at the confluence of the two rivers, recognising life origins and the indigenous Khoi people.
22. Upgraded intersection of new one-way bridge from Voortrekker Rd and continuing link to MGV.
23. New high density mixed use blocks reinforce extra importance of Berkley Road for commercial, office & residential with Parking.
24. The potential for limited graded development of the Alexandra site to be sensitively explored with local & broader stakeholders
25. The potential for limited graded development of site next to MGV to be sensitively explored with local & broader stakeholders.
26. The special requirements MGV to be sensitively explored with local & broader stakeholders including renovations & new square.
27. MGV Householder to be sponsored to do home improvements and get upgraded sports field,allotments and solar panels.
28. Existing high security facility to be moved and fences reduced. Bridge over M5 open to NMT and designated one way cars.
29. Black River has a new system of weirs that create raised flood retention pond water levels with minimum silt build up.
30. Valkenberg Hospital fences and gate are compacted to make space around the facility for public to move around the facility.
31. The Mowbray Hotel to be protected. The green space to north & west is heritage green space with clear limit to development.
32. The berm, new gym, flood pond to be well maintained. A new NMT access route built over improved non silting weir.
33. Existing natural and built heritage to be maintained as part of the park with fully managed farming allotments not development.
34. School field is a link in 'green chain' to Table Mountain National Park. It needs further extension up Penzance/George to TMNP.
35. The heritage status of Observatory as a HPOZ needs to be protected and the community vision of Good Development, respected.
36. Observatory narrow roads to be limited to trucks. Extra parking facilities supported rather than on-street parking blocking roads.
37. Lower Main Road to be enhanced as an 'activity street' with pedestrian friendly community vitality options regularly enabled.
38. Extended HPOZ integrated into existing industrial with fresh live-work play mixed development made to fit in.
39. Revised rail route under Malta Bridge, NMT links from Observatory's Nelson and Scott Roads to the new canal and 'Riverside".
40. Existing Rail rolling stock and sheds contained to facilitate a future innovative job creation tourist orientation Riverside centre.
41. Future overhead road links to access storage facilities over Rolling Stock Tracks using containers supported on structural frames.
42. Existing low bridge removed. New weir and new appropriate bridge links under M5 to Koeberg Station and Voortrekker Road.
43. Upgraded Koeberg Station with upgraded flyover bridge access. MyCity station linking to the entire TRU-Park and Surrounds.
44. Maitland existing housing area needing support to upgrade/ be sponsored to do home improvements and greening kids parks.
45. New access road link to Maitland station, Voortrekker Road east and the north part of Maitland where many good facilities exist.
46. Ndabeni industrial area transformed into a high density model live-work-play sustainable urban development flagship.
47. Existing factories upgraded while infill blocks provide a mix well located urban accommodation. Parking and work space included.
48. Convenient shopping and pedestrian /NMT routes link through green interlinked open spaces and sustainable green architecture.
49. Alexandra Rd is an activity corridor with appropriately scaled buildings on either side and free moving traffic.
50. Some side streets cross under Alexandra Road enabling safe east- west access including to underground parking where required.
51. The Oude Molen and other sensitive precincts remain undivided and local stakeholders are supported to implement their plans.
52. Sensitive green space is conserved "no-go" for development. Used appropriately above the flood line for gardens, concerts.
53. Roads around the park should be partially screened for noise, security and privacy while the community should have good access.
54. The on-ramps and off-ramps should enable safe unblocked connecting, while minimising impact on the heritage site.
55. North-south rail line needs to be appropriately fenced. Strubens Rd needs improved links along TRU-Park corridor.
56. Transition of HPOZ needs to be enforced. Outbound free flow transport on Main Road needs upgrade. Bus stops need redesign.
57. High density development along Main Road is to be encouraged but the scale and character of buildings must fit in to the HPOZ.
58. The sensitive urban edge along transition between high density main Road corridor and the fine grain heritage area needs limits!
59. One way road access corridors need special care to prevent speeding and controls on parking. Small parking garages are needed.
60. Rochester Road (continuation of Browning) becomes an important one way down to Salt River station and link to Malta & Berkley
61. Lower Rochester to Malta area to be higher density apartments. Future underpass links to 'Riverside. Scott to be up-road couple.
62. Transport Interchange with raised pre-stressed double or triple level " park and ride" parking garage over the multiple rail lines.
63. Mixed high density apartments among commercial buildings on new 'Khoi Island' south of Voortrekker Road, between 'rivers'.
64. Mixed high density apartments among commercial buildings on new 'Khoi Island' north of Voortrekker Road, between 'rivers'.
65. New bird island apartments on transition from Black to Salt River, south-west of Koeberg Interchange, connected to Maitland.
66. Lower Maitland Industrial and commercial eventually to become mixed with residential high density apartments?
67. Major potential development corridor along Voortrekker Road starting with local infill close to railway stations.
68. New bridges near Maitland station giving access along Voortrekker Rd, towards Brooklyn and on ramp to N1.
69. Potential intense pockets of high density residential apartments in a mixed commercial context.
70. Ndabeni with intense pockets of high density residential apartments in a mixed commercial context including combined parking.
71. East Ndabeni with pockets of high density residential apartments in a mixed commercial context including combined parking.
72. South-east Ndabeni with pockets of high density residential apartments in a mixed commercial context with combined parking.
73. Proposed new underpass link under rail and under Alexander Road, between Pinelands and Oude Molen (50)
74. North-south Rail lines north-south before going east to Langa and south to Athlone.

please write comments, issues and possible ideas you want to add and/or highlight:

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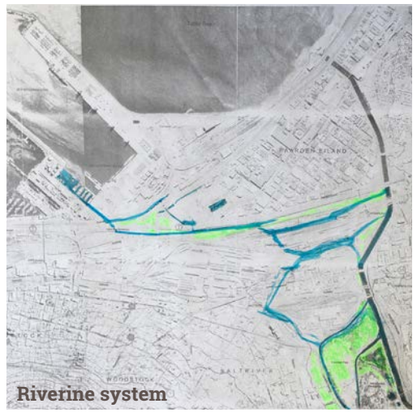


Riverine system

What if the Park ...
- Preserves as much of the green space as possible while making the park work.
- The park is recognised as an environmentally rich area.
- it is seen as a safe destination for play, including areas for picnic, canoeing and paths for walking, jogging, cycling and horse riding.
- It is seen as an internationally recognised birding destination
- It is one of the few safe enclaves where the Western Leopard Toad thrives.
- Continues with public outreach to schools and open nights at the Astronomical Observatory and Enviro-centre.

What if the riverine system ...
- Is only ever altered after extensive environmental assessment.
- The flood plain is respected and future development is minimised, taking this properly into account.
- Existing canalisation is evaluated and possibly removed.
- The storm water draining directly into the system is assessed and the latest technology is used to purify the water before allowing it into the system.
- The Valkenberg wetland is assessed with the intention of it being properly re-established.
- The riverine system is an internationally recognised birding destination.
- The banks and rivers are a pleasant and well maintained area for recreation. The railway bridges and other obstacles that aggravates flooding are assessed and appropriately modified
- A system of ponds along the rivers is provided to offer more space for the water during flooding season.
- A wind pump can also pump water back into a storage facility.
- Salt River canal could also be navigable.
- Weirs could be introduced along the Black River; this would allow for ponding of water along the river, slowing the water and allowing for possible navigability of canoes.

What if access and movement ...
- is improved by a network of Non-Motorized Transport routes: around the edge of Oude Molen, alongside the Black River, crossing the M5 and linking to Observatory Road, along the Liesbeeck River, to Langa, Athlone and Hazendal.
- It is proposed that development extend to substantially improve public transport and one major intervention would be around Salt River station.
- Substantial development is proposed to make better use of the wasteful railway rolling stock lands and we would support making the river navigable into a moderate marina and improving the river in general.
- The railway lines could be reconfigured to allow for a more circular movement of people; this way all commuters do not need to travel all the way into the CBD, but could go directly to their desired destination.
- Underneath the redeveloped [old] Hartleyvale, a MyCiti Bus stop/hub is introduced linking the current N2 and Salt River routes. This public transport hub could serve as a gateway to the park.
- The on-ramp connection from the M5 to the N2 and Liesbeek Parkway to N2 be widened to maintain 2 merging lanes instead of the current 1 lane bottlenecks with 'reverse crossing'.
- Looking to the north, several connections to Voortrekker Road should be provided.
- The extension of Berkley Rd towards Malta Rd could be located along the north side of the river along with the railway line. This will offer the opportunity to re-design the railway road bridges allowing a better water flow and making the river navigable.
- A future new bridge crossing the M5 and the Black River would also allow people from Oude Molen and Maitland Village to cross the M5 safely to reach Observatory and vice-versa.
- Valkenberg security could be provided at the building level rather than for the whole site. In this way, people could move through. Public pathways should be provided as well as open the existing bridge to public use.

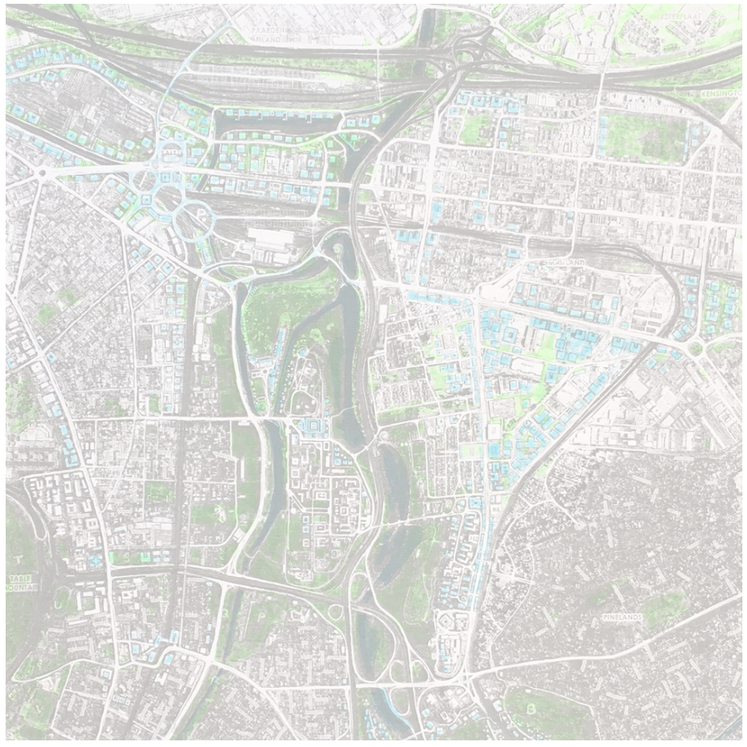
What if social infrastructure ...
- The currently dilapidated Hartleyvale stadium at the corner of Station Road and Liesbeek Parkway should be redeveloped to form new seating and equipped with a MyCity stop/hub.
- The current hockey and soccer sports fields are maintained and improved.
- The swimming pool is upgraded.
- The green river area and surrounds is a safe picnic and recreational destination, no less desirable than Kirstenbosch.

What if heritage ...
- The unique cultural landscape is preserved.
- The circle above Berkley can be a heritage site. This is special place. It was the frontier, if we go back to the origins of the people who 1st inhabited here. We can create a sanctuary for memorialisation of our origins at the point of the confluence.
- The Observatory should not be touched. There could be small scale additions/alterations, but no large development.
- Maitland Garden Village needs to be treated with sensitivity and connected to the Park.

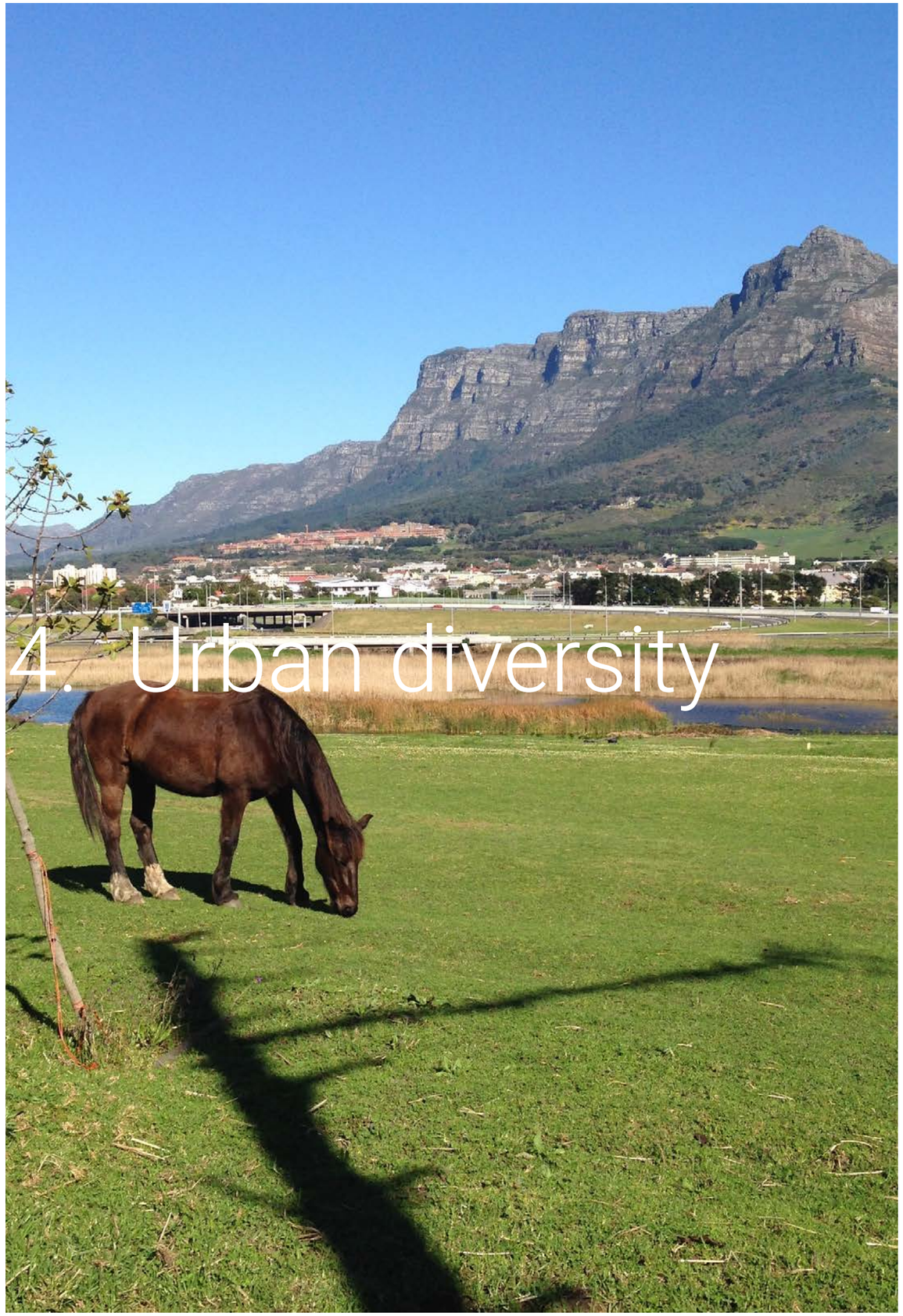
What if future development...
- Does not happen within the current 100 year flood plain area or on any currently green land.
- This Scenario is open to considering a contained and moderate expansion of the existing River Club Facility, to include improved conference facilities, an international quality hotel, some self-catering accommodation that could also cater for the visiting SKA scientists, various recreational upgrades including a state of the art gym facility, along with this a Green Learning Centre, urban farming, children aftercare facilities, bike tracks, skating, horse riding and many more recreational facilities that make the park a world class facility.
- Includes the improvement of the Malta Road and Hartleyvale sports fields and swimming pool
- The proposed new SKA building could be located between the SAAO and Valkenberg, where the current entrance is. The position would have direct access to Liesbeeck Parkway, the MyCiti Bus route and Observatory train station.
- Oude Molen remains a self-sustaining mixed use area including the eco-village with a mix of small businesses and living spaces.
- Ndabeni is open to development as Brownfield site. Any new BIOVAC buildings are sited in Ndabeni. This area is developed as a dense live-work-play environment using the latest green sustainable technology.
- Any proposed upgrade of River Club is restricted, with a minimised footprint in extension and height. No shifting of rivers or major tampering with flood plains is undertaken.
- Alexandra Road could be redeveloped as a mixed use urban corridor along with other activity corridors spreading growth and upgrades in the Ndabeni area, into Langa and towards Athlone, along the Klipfontein Corridor, on the side of Sybrand Park, connecting into Maitland and the Voortrekker Road Corridor, connecting to Observatory and Salt river, Paarden Eiland and Woodstock, including bringing life and vibrant growth into the wasteland of the Culemborg area adjacent to the Foreshore.
- The Valkenberg estate should be better integrated into the park, limiting its footprint and reducing the barriers to public use of the park. The area of the existing entrance road should be considered as a suitable site for the SKA facility, that needs to be linked to the Astronomical Observatory without intruding into the precinct that is regarded as ultra-sensitive and a "no go" area for development.
- Results in a bulk of approximately 1.4 mil m² spreading over a broad area mainly outside the park and doing our utmost to avoid development in the floodplain. It will in time be an incentive to even greater growth in a sustainable and efficient way.

please write comments, issues and possible ideas you want to add and/or highlight:

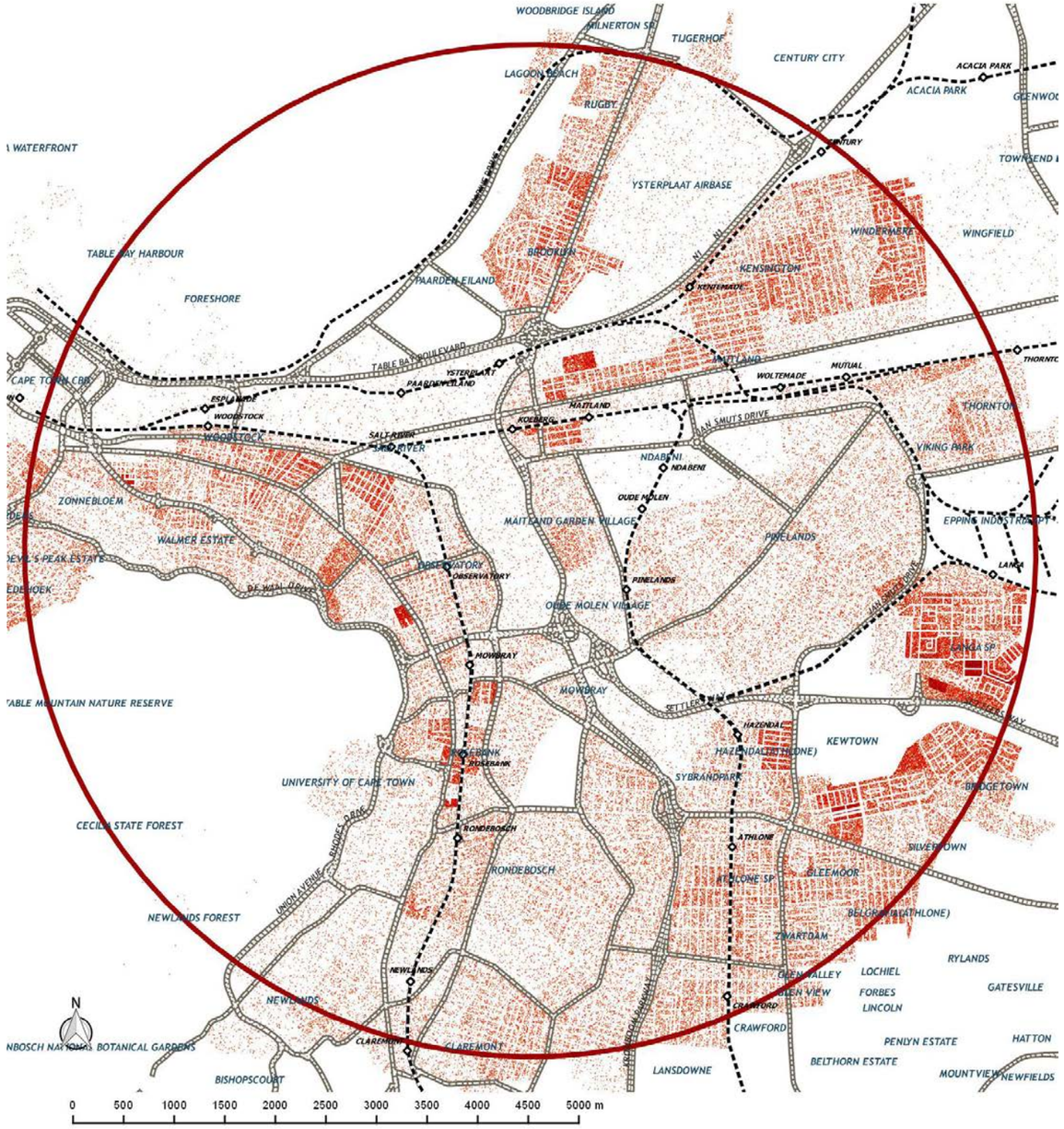
please map comments, issues and possible ideas you want to add and/or highlight:



part 2_ baseline findings, constraints and opportunities



4. Urban diversity



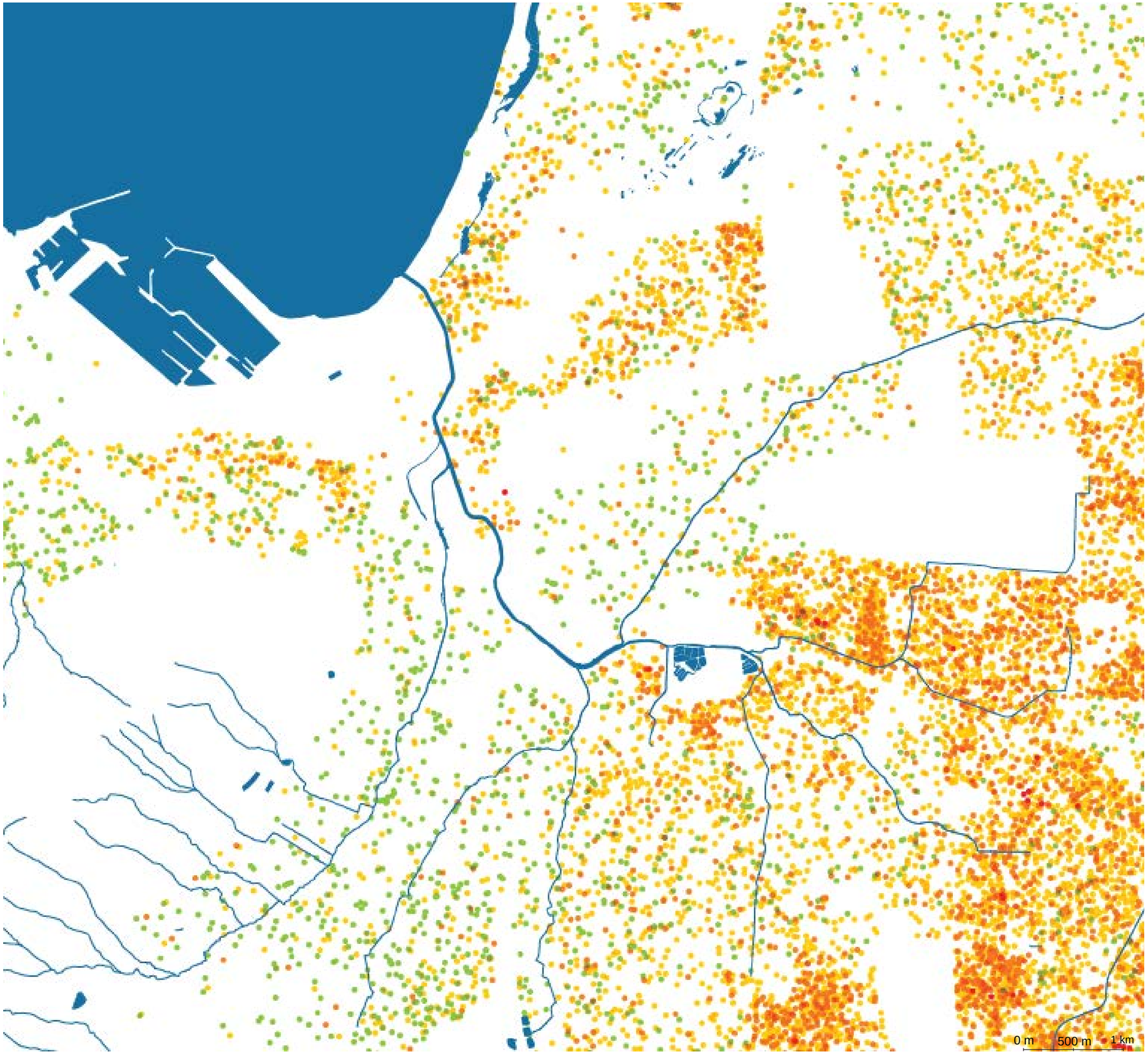
0 - 7	25039
8 - 18	29705
19 - 35	74230
36 - 65	67334
66+	15444

212 000 people live within 5 km radius of the TRU-Park epicentre.

NOTE TO MAP CONTENT
In this map the 212,000 people (as counted in the 2011 Census) who live within 5km of the TRUP epicentre are represented with one orange dot each so as to better understand the distribution of the local constituency.

railway_stations
railways
major roads

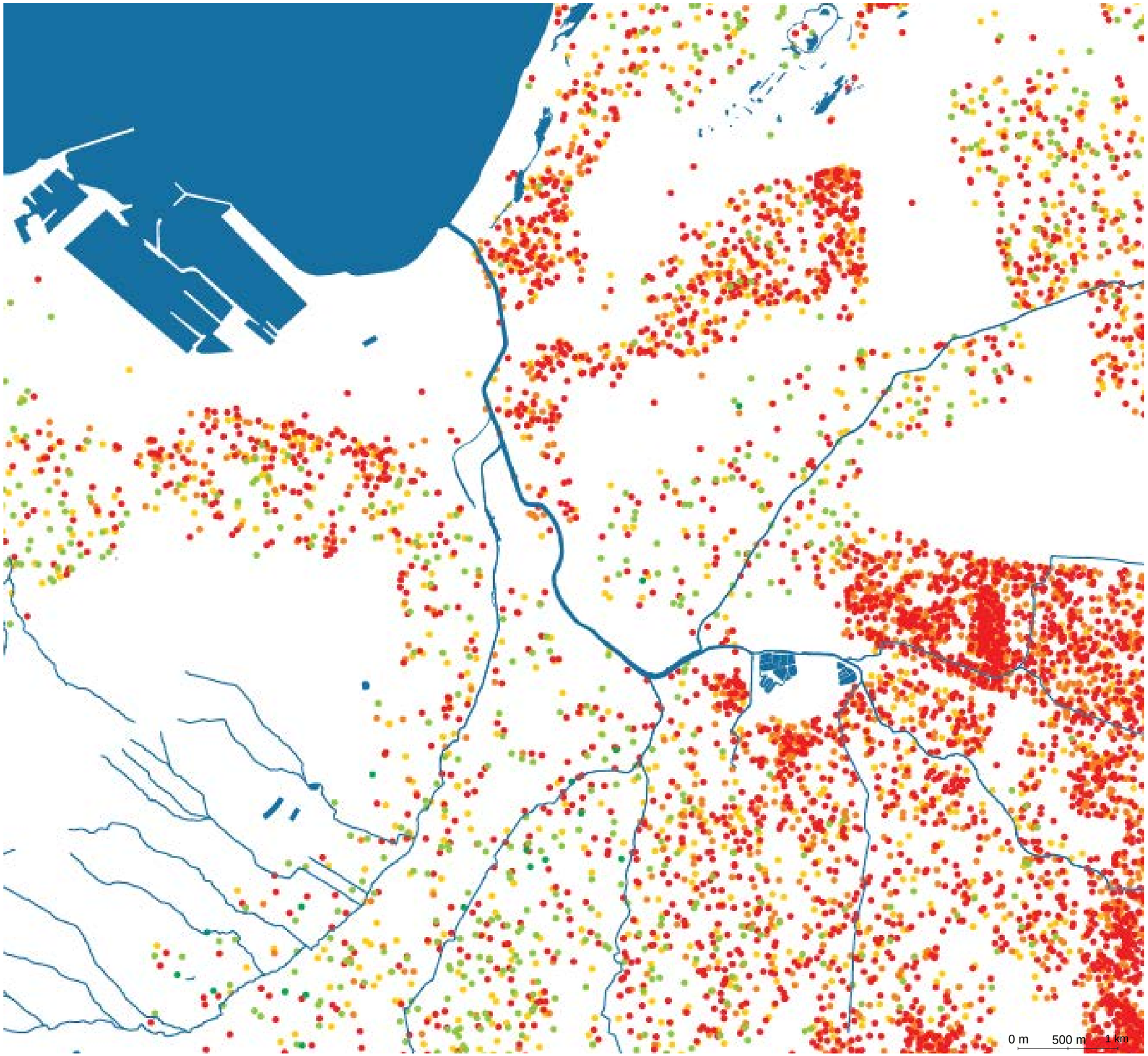
what do you think?.....



level of education [1 dot = 50 people]
1:20 000 @A1
[12 x 12km]

- No Education
- Primary Education
- Secondary Education
- Higher Education

what do you think?.....



monthly household income distribution [1 dot = 50 people]
1:20 000 @A1
[12 x 12km]

- No Income
- R1 - R3 200
- R3 201 - R12 800
- R12 801 - R51 200
- R51 201 and above

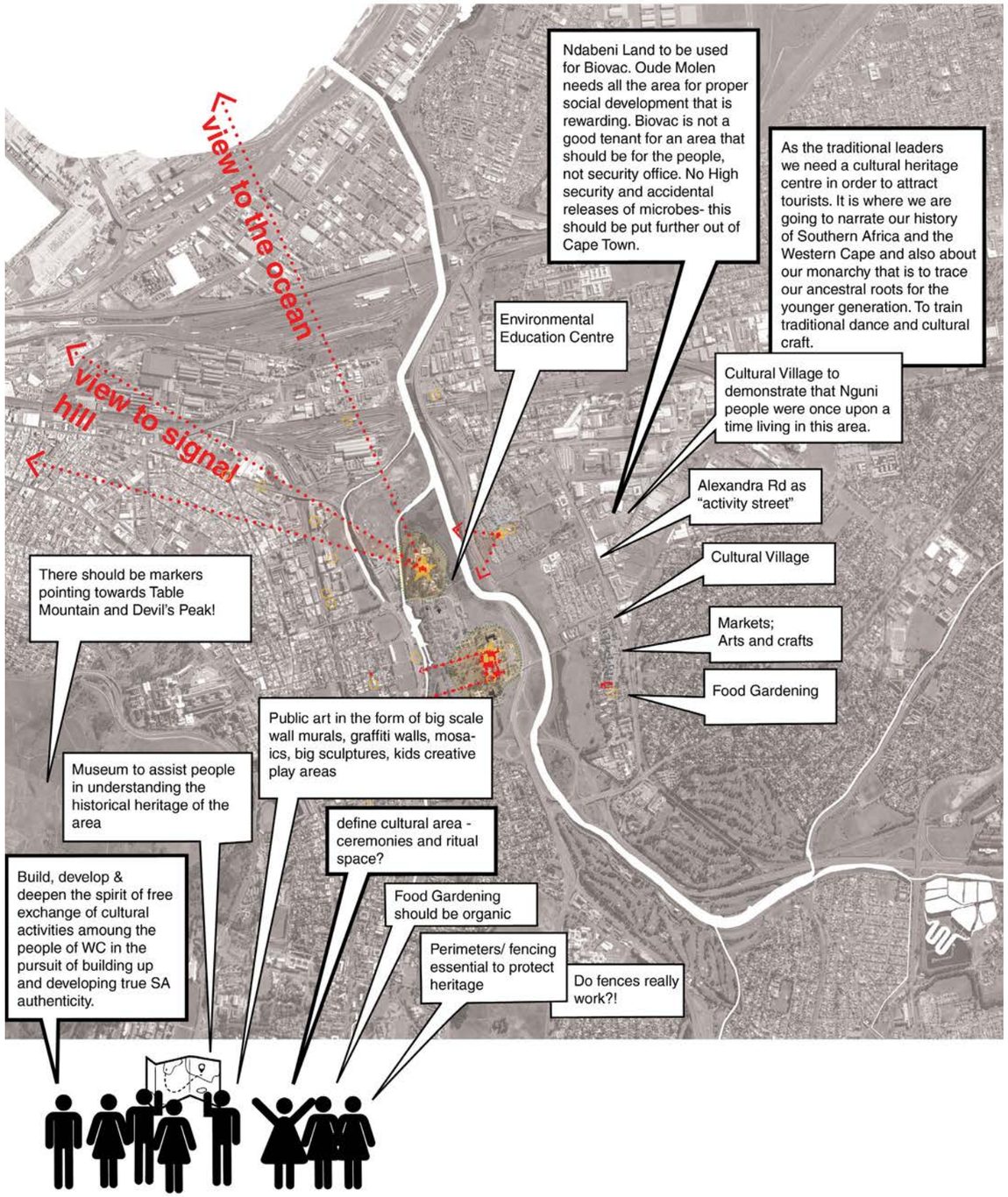
5. Heritage and cultural narratives

The TRUP area is an area of high cultural significance. It is a multi-layered complex series of overlays of sites and associations of value and covers such values as ancestral use, historical significance, institutional and scientific significance, significance as a green space containing valuable vegetation, a historic place of barriers, to contemporary significances as a recreational landscape within a riverine setting and a landscape presenting an opportunity for the redress of past barriers and inequalities.

It is necessary to examine the TRUP for both tangible and intangible heritage values which are rooted in the past histories of the sites and the wider surrounding environment; and which may affect its contemporary significance.

Intangible aspects of heritage as identified do not refer only to the TRUP site but affect the Cape Peninsula as a whole and the West Coast area, all of which were affected by pre-colonial seasonal migrations. They also affect the River Club area, the PRASA owned land and other areas in proximity or included in the TRUP Specific area. Identification of these intangible aspects is limited and cultural significances are notional and associational.

- The use of the site for summer grazing by transhumant pastoralists, largely the Gorinhauqua and Goringchoqua during the pre-colonial period.
- The placement of barriers and the development of frontiers by the Dutch East India Company (VOC) to limited access to fertile land and water systems.
- The sites of the granting of the first lands under individual tenure; and the introduction of private property ownership and use in the early Dutch Colonial Period.
- Early industrial use and the development of windmills to support agriculture in the area. These include the Oude Molen, and the Nieuwe Molen which remains.
- The presence of early homesteads and werfs which faced the Liesbeek River and used the riverine system for the purposes of irrigation using channels, weirs and dams.
- The use of the site for scientific institutional purposes i.e. at the Astronomical Observatory.
- The use of the site for medical purposes which required societal distance and separation i.e. the Valkenburg Mental Hospital and the Alexandra Institute.
- The use of the site for racially based segregation in terms of medical institutions i.e. the Valkenburg East Mental Hospital.
- The use of the site for segregated formal housing systems i.e. at Maitland Garden Village.
- The development of high density housing on the periphery of the TRUP in Observatory and Salt River
- The growth of the railway transportation links, the development of rail lines across the mouth of the isthmus and the estuary.
- The loss of the historic werfs to development i.e. at Malta Farm and Vaarschedrift.
- The use of the areas prone to flooding and unsuitable for housing for recreation purposes i.e. Hartleyvale and the sport fields along the Liesbeek Parkway.
- The cultural landscape of the area including mature tree plantings and avenue of trees.



WHAT ABOUT HERITAGE...?

5.1. Heritage

DIAGRAM 1: HERITAGE RELATED DESIGN INFORMANTS

Scale: NTS

NM & Associates Project Team
TWO RIVERS URBAN PARK

LANDSCAPE CHARACTER AREAS

- 1. Ndabeni
- 2. Alexandra
- 3. Maitland Garden Village
- 4. Valkenberg East/ Oude Molen
- 5. Valkenberg West
- 6. South African Astronomical Observatory & Hill
- 7. River Club & Vaarschedrift
- 8. Liesbeek Parkway Corridor

LOCAL HERITAGE PROTECTION

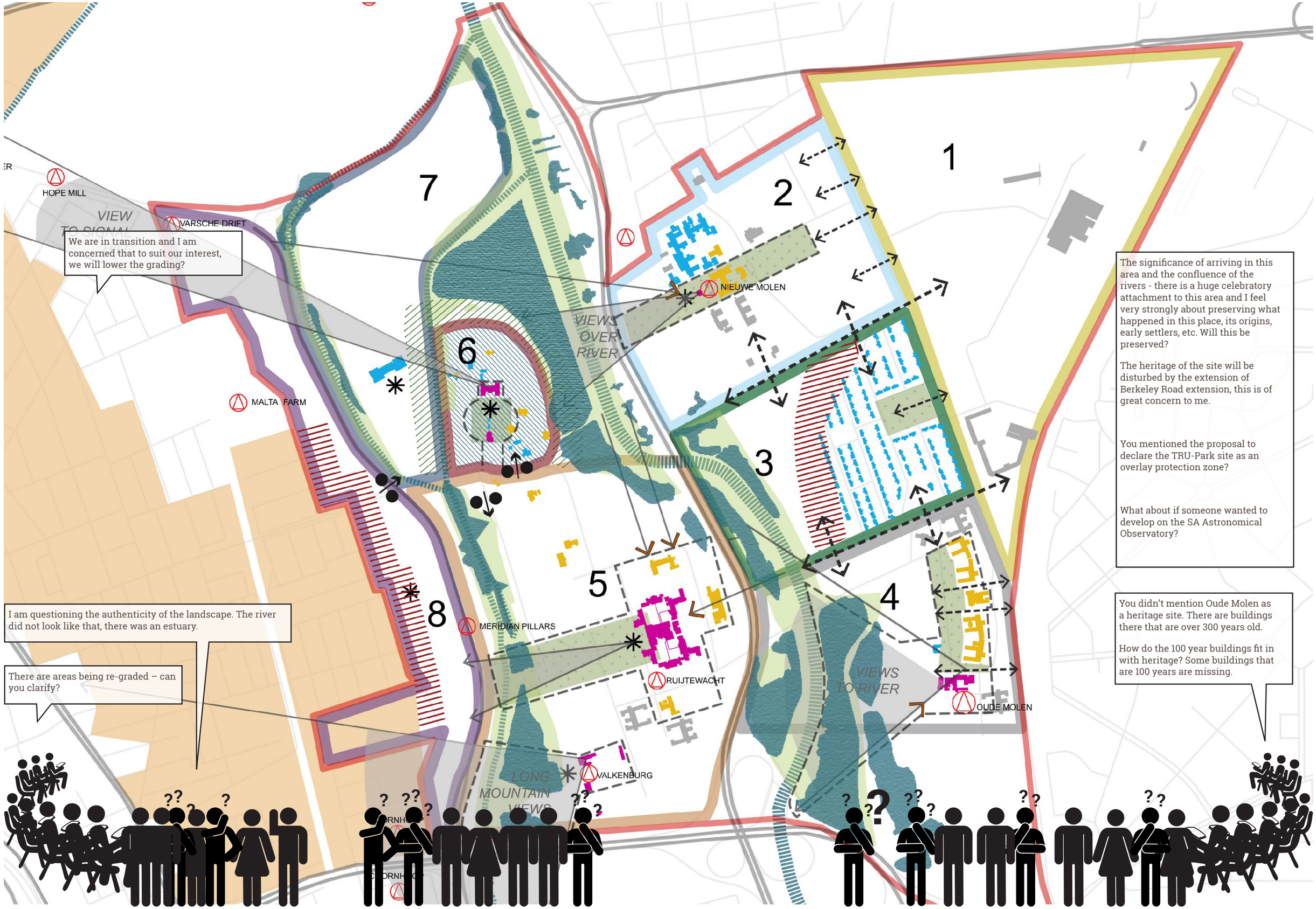
- Sites with historical archaelogical potential
- Formally declared heritage protection overlay zones on/ immediately adjacent to the site
- Biodiversity areas
- Water Bodies
- Green buffer zone/development exclusion area
- Scaling mechanisms apply, potential height restrictions or landscaping
- Significant viewcones and corridors
- Permeability of edges
- Focal point
- Gateway

STRUCTURES AND AREAS TO BE CONSERVED

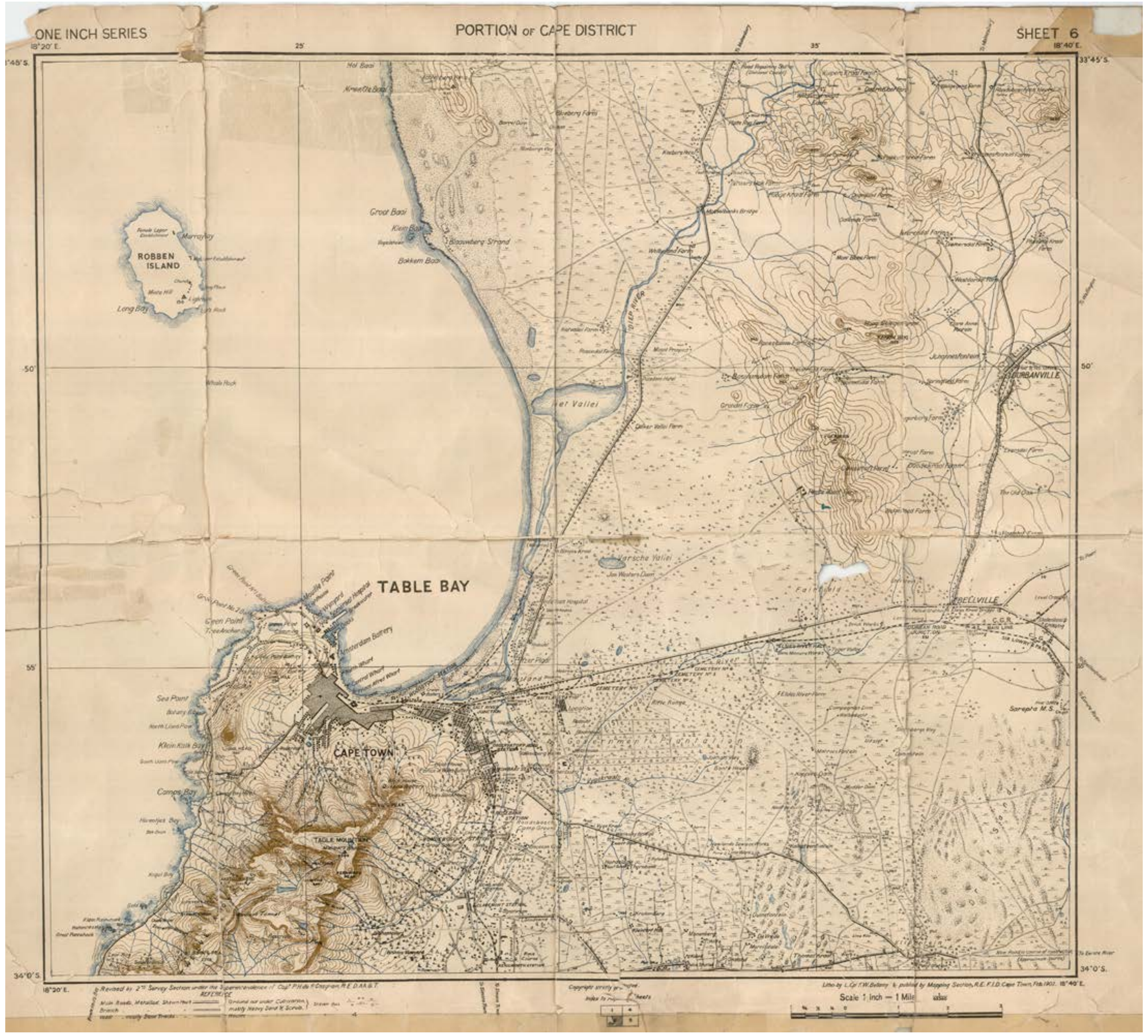
- Grade I site
- Buildings protected by section 27 (PHS)
- Buildings to be conserved and context protected
- Historic green space not to be developed

STRUCTURES THAT MAY BE DEMOLISHED WITH HWC PERMISSION

- Grade IIIC structures on the site that may be demolished
- Ungraded structures older than 60 years on or within immediate proximity of the site
- Potential Heritage Precincts (conservation measures apply, guidelines developed)


HOPE MILL
VIEW TO SIGNAL
VARSCHE DRIFT
We are in transition and I am concerned that to suit our interest, we will lower the grading?
MALTA FARM
7
6
8
5
3
2
1
4
VIEWS OVER RIVER
NIEUWE MOLEN
MERIDIAN PILLARS
RUIJTEWACHT
VALKENBURG
LONG MOUNTAIN VIEWS
VIEWS TO RIVER
OUDE MOLEN
I am questioning the authenticity of the landscape. The river did not look like that, there was an estuary.
There are areas being re-graded – can you clarify?
The significance of arriving in this area and the confluence of the rivers - there is a huge celebratory attachment to this area and I feel very strongly about preserving what happened in this place, its origins, early settlers, etc. Will this be preserved?
The heritage of the site will be disturbed by the extension of Berkeley Road extension, this is of great concern to me.
You mentioned the proposal to declare the TRU-Park site as an overlay protection zone?
What about if someone wanted to develop on the SA Astronomical Observatory?
You didn't mention Oude Molen as a heritage site. There are buildings there that are over 300 years old.
How do the 100 year buildings fit in with heritage? Some buildings that are 100 years are missing.

what do you think?.....


ONE INCH SERIES
PORTION OF CAPE DISTRICT
SHEET 6
18°20' E.
18°40' E.
33°45' S.
34°0' S.
ROBBEN ISLAND
Long Bay
Groot Baai
Klein Baai
Blaauwberg Strand
Bokkem Baai
Het Vallei
DIEP RIVER
DURBANVILLE
BELLVILLE
TABLE BAY
Sea Point
Camps Bay
CAPE TOWN
Sarepta M.S.
Scale 1 inch — 1 Mile

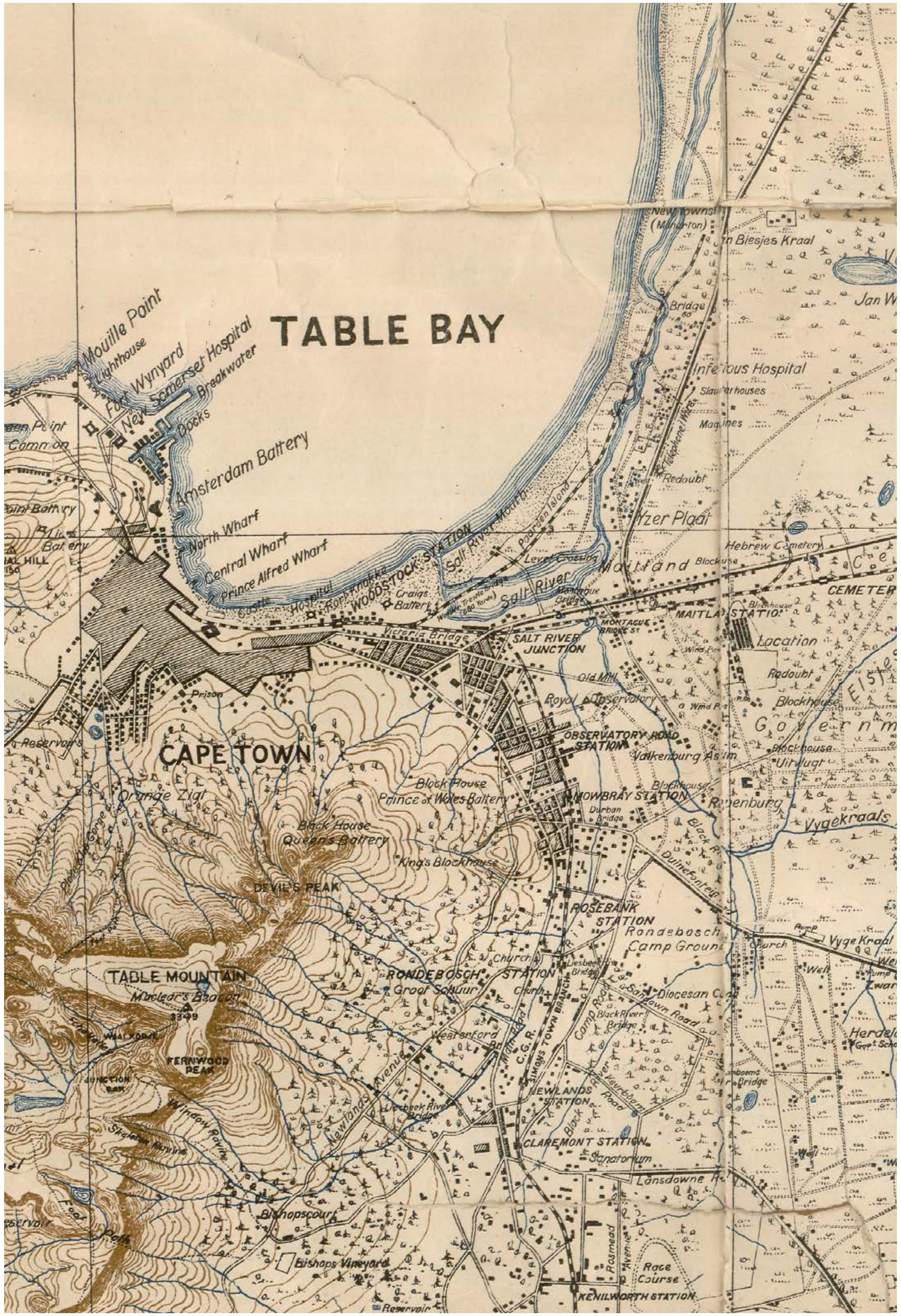
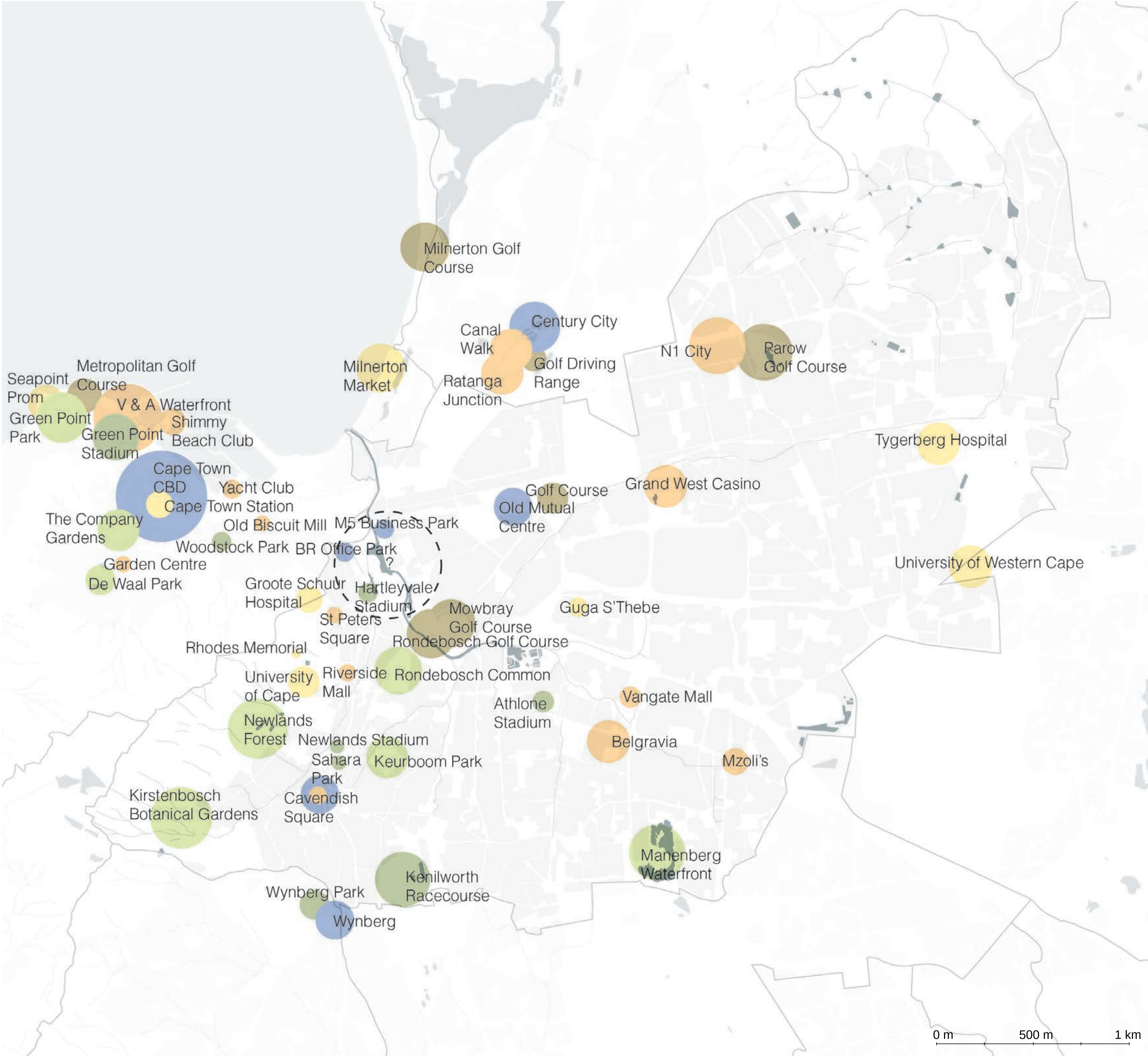


TABLE BAY
Mouille Point
Lighthouse
Fort Wynyard
New Somerset Hospital
Breakwater
Docks
Amsterdam Battery
North Wharf
Central Wharf
Prince Alfred Wharf
Castle
Hospital
Roggebaai
WOODSTOCK STATION
Craigs Battery
Salt River Mouth
Paarden Island
Level Crossing
Salt River
Victoria Bridge
SALT RIVER JUNCTION
Maitland
MAITLAND STATION
Hebrew Cemetery
CEMETERY
Location
Redoubt
Blockhouse
Old Mill
Royal Observatory
Yzer Plaat
Infectious Hospital
Slaughterhouses
Magazines
Telephone Wire
Bridge
Jan Biesjes Kraal
Prison
CAPE TOWN
Orange Zigt
Platteklip Gorge
Reservoirs
Block House
Prince of Wales Battery
Queens Battery
King's Blockhouse
DEVIL'S PEAK
TABLE MOUNTAIN
Maclear's Beacon
3549
FERNWOOD PEAK
Window Ravine
Skeleton Ravine
Bishopscourt
Bishops Vineyard
Reservoir
OBSERVATORY ROAD STATION
Valkenburg As'lm
MOWBRAY STATION
Durban Bridge
Rosenburg
Vygekraals
Duinefontein
ROSEBANK STATION
Rondebosch Camp Ground
Church
RONDEBOSCH STATION
Groot Schuur
Liesbeek Bridge
Diocesan College
Sandown Road
Camp Road
Black River Bridge
Westerford
Main Road
C.G.R.
SIMONS TOWN BRANCH
Newlands Avenue
Liesbeek River Bridge
NEWLANDS STATION
Keurboom Road
CLAREMONT STATION
Sanatorium
Lansdowne Rd
Rosmead Avenue
Race Course
KENILWORTH STATION
Vyge Kraal
Well
Pump

5.2. Mental map

What could be the TRU-Park role/identity in the mental map of cape Town?

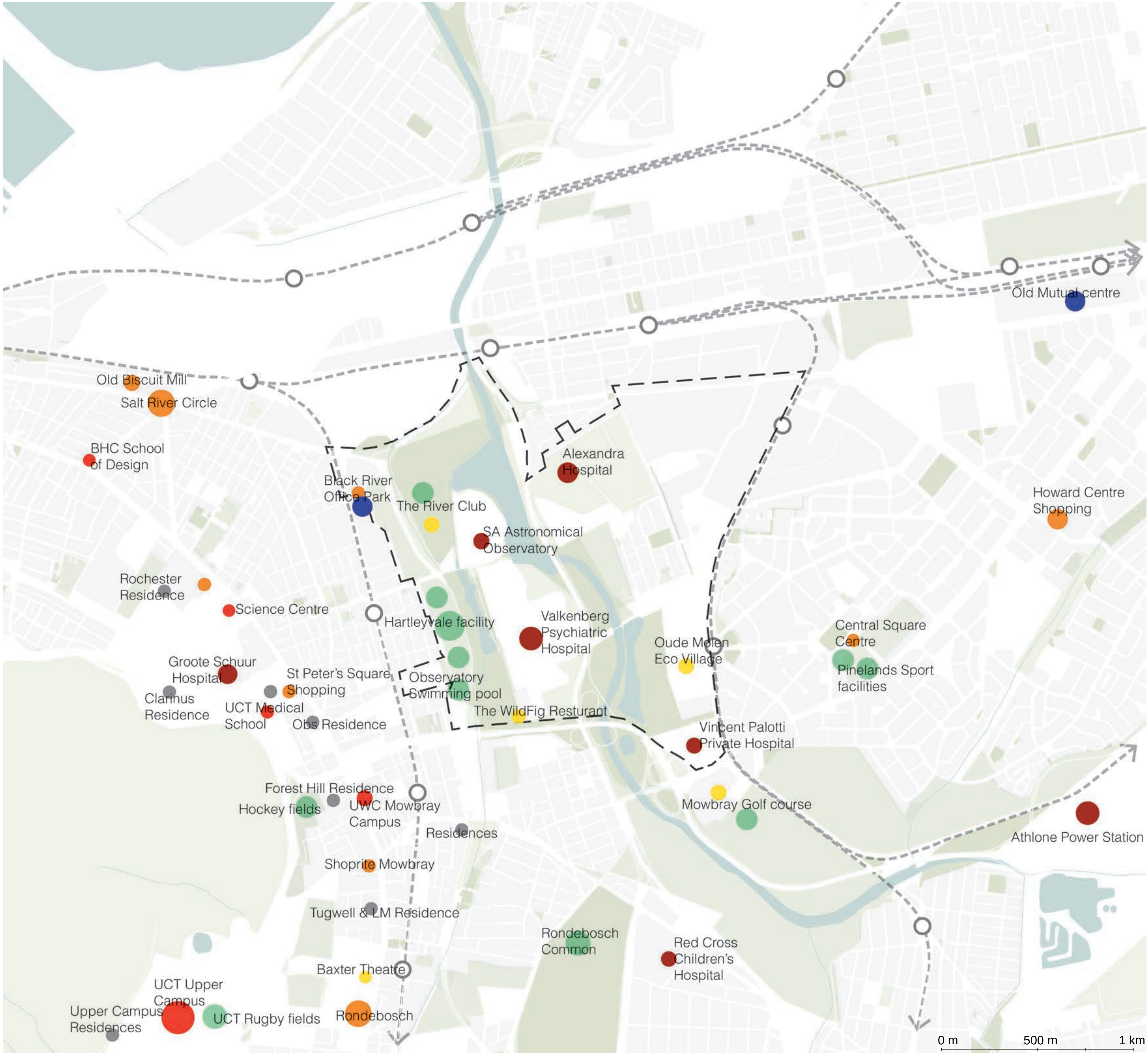


mental map of Cape Town [destinations]

1:100 000 @A3

- Green spaces / parks
- Stadiums
- Golf course
- Retail
- Office space / business
- Recreational / institutional / education / public
- Urban fabric

What are the existing attractions within the TRU-Park to be enhanced? What could be added/ What is missing within the TRU-Park? ....



mental map of TRU-Park [destinations]

1:20 000 @A1

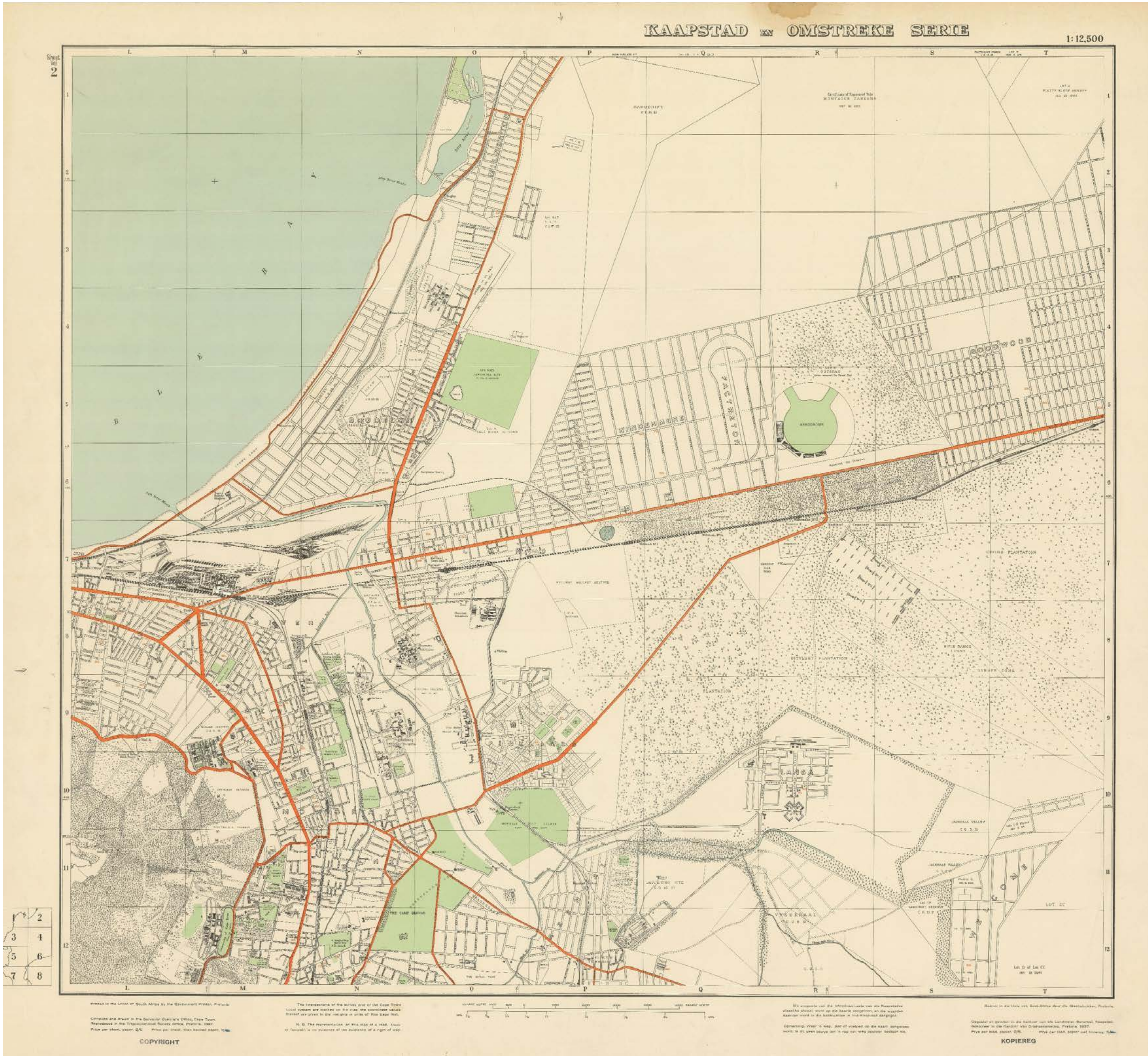
- Green spaces / parks
- Hospitals
- Universities
- Retail
- Office space / business
- Recreational /entertainment
- Student residences

TRU-Park CO-design Workshop | 18 February 2017

CITY OF CAPE TOWN AND ENVIRONS

DIE STAD KAAPSTAD EN OMSTREKE

Sheet Vel 5



TRU-Park CO-design Workshop | 18 February 2017

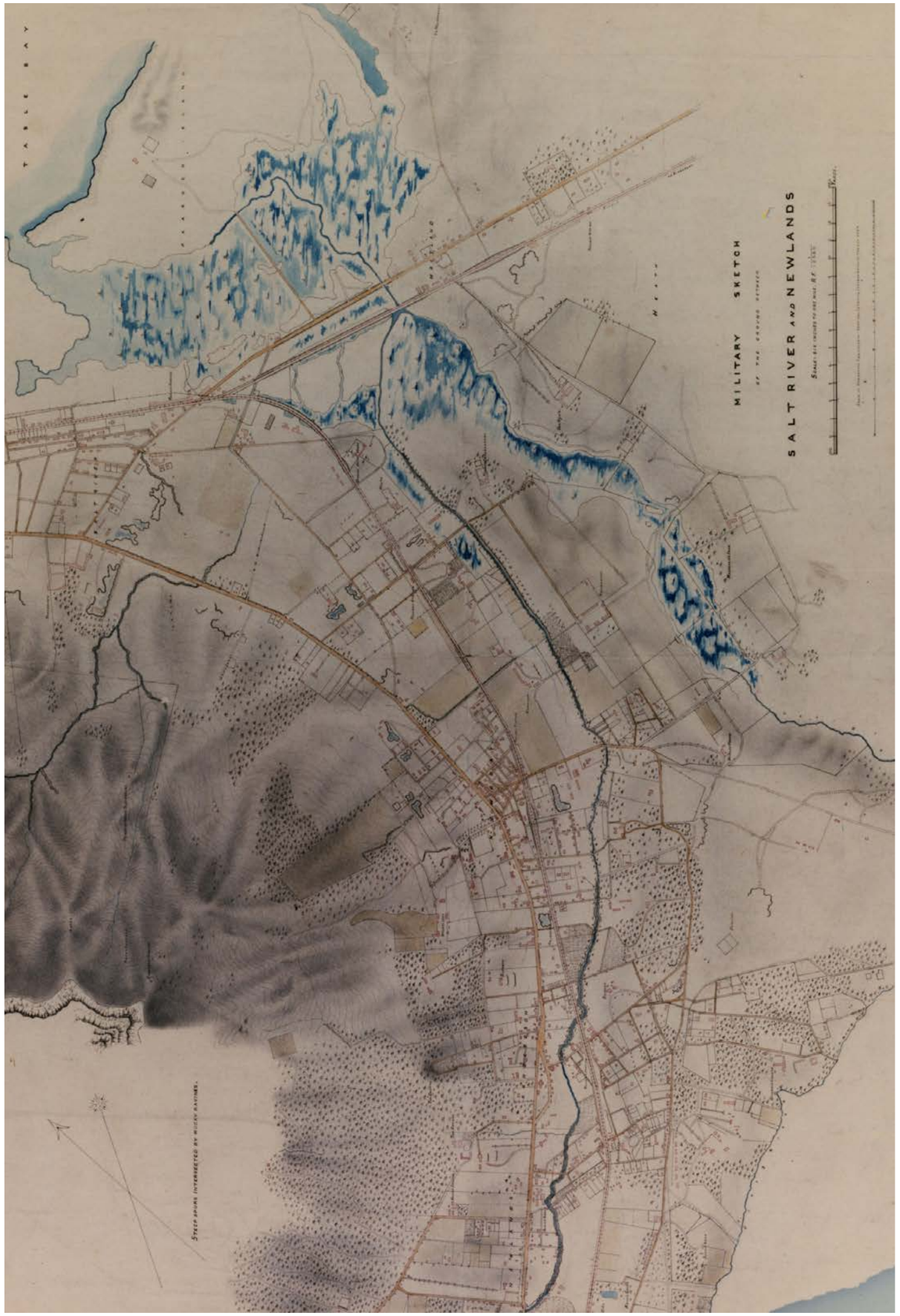
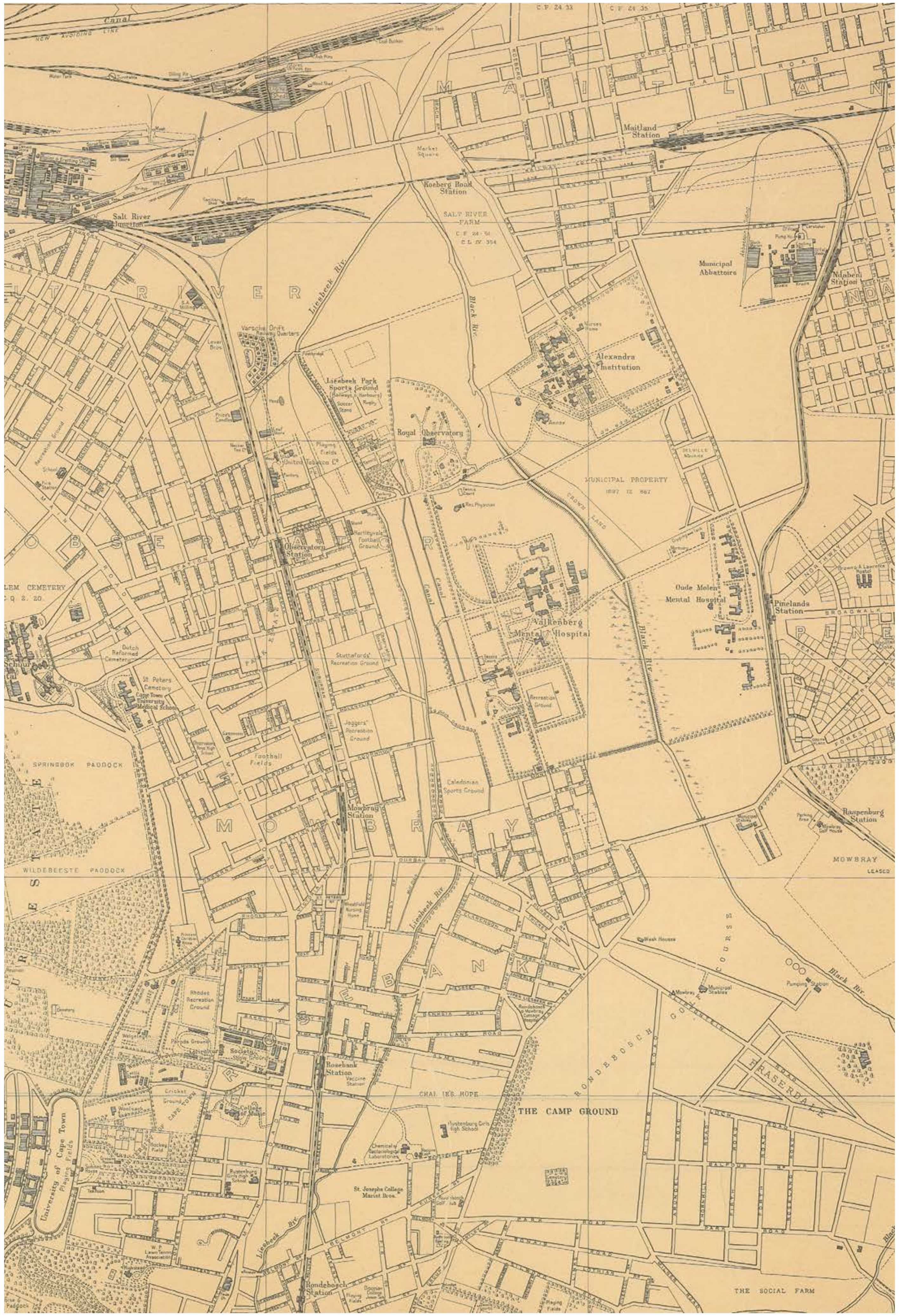
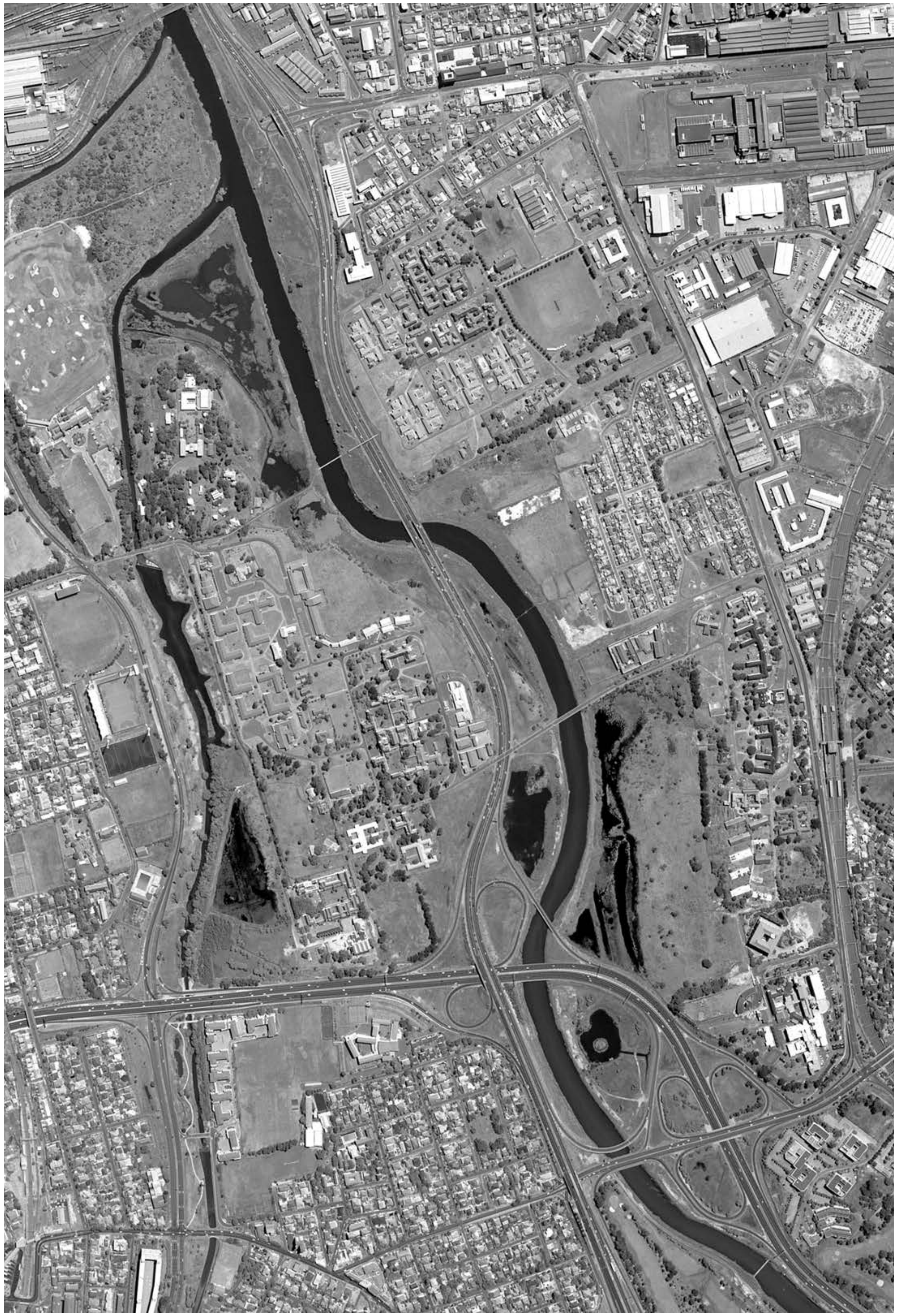


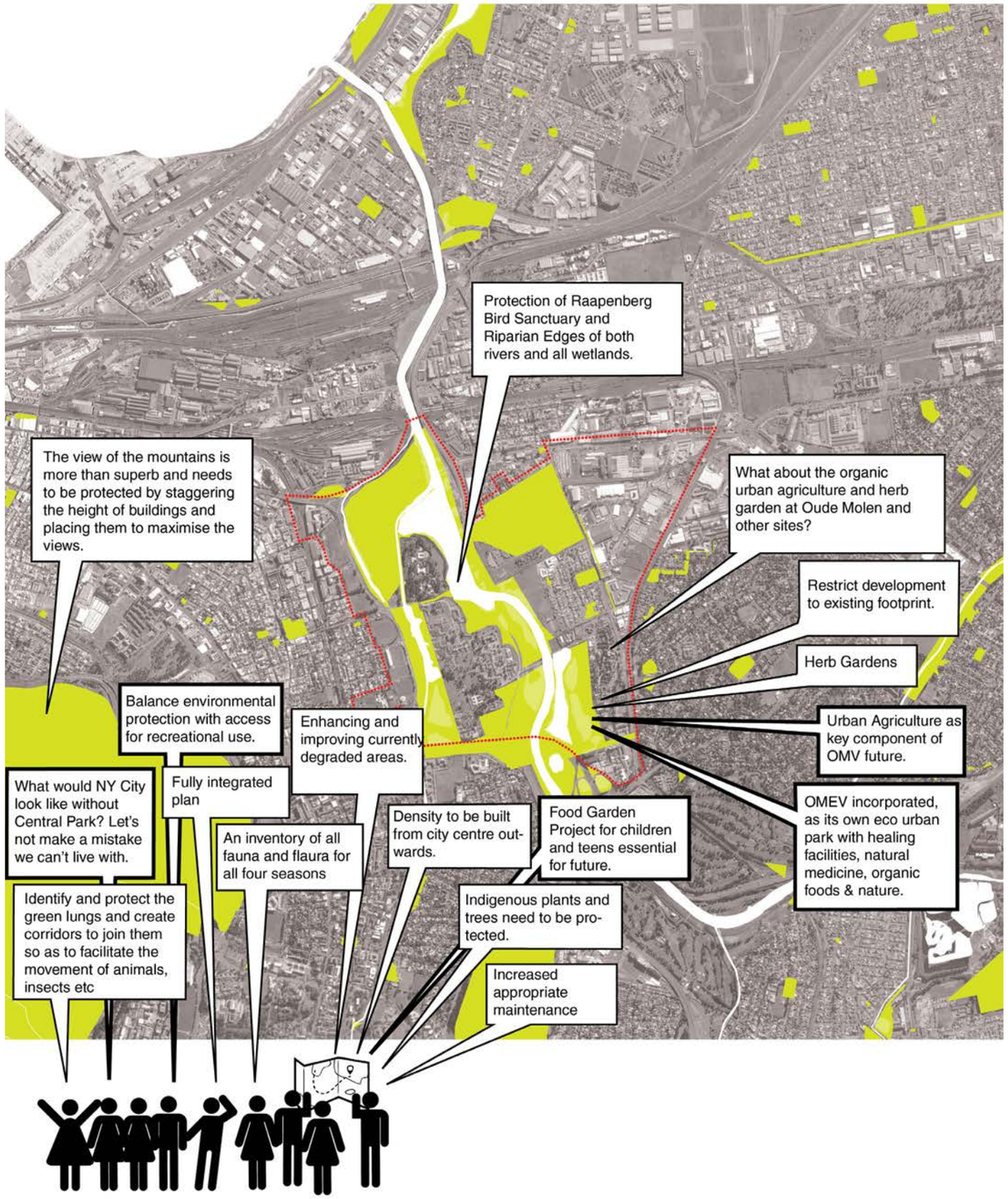
TABLE BAY
MILITARY SKETCH
SALT RIVER AND NEWLANDS


NEWLANDS

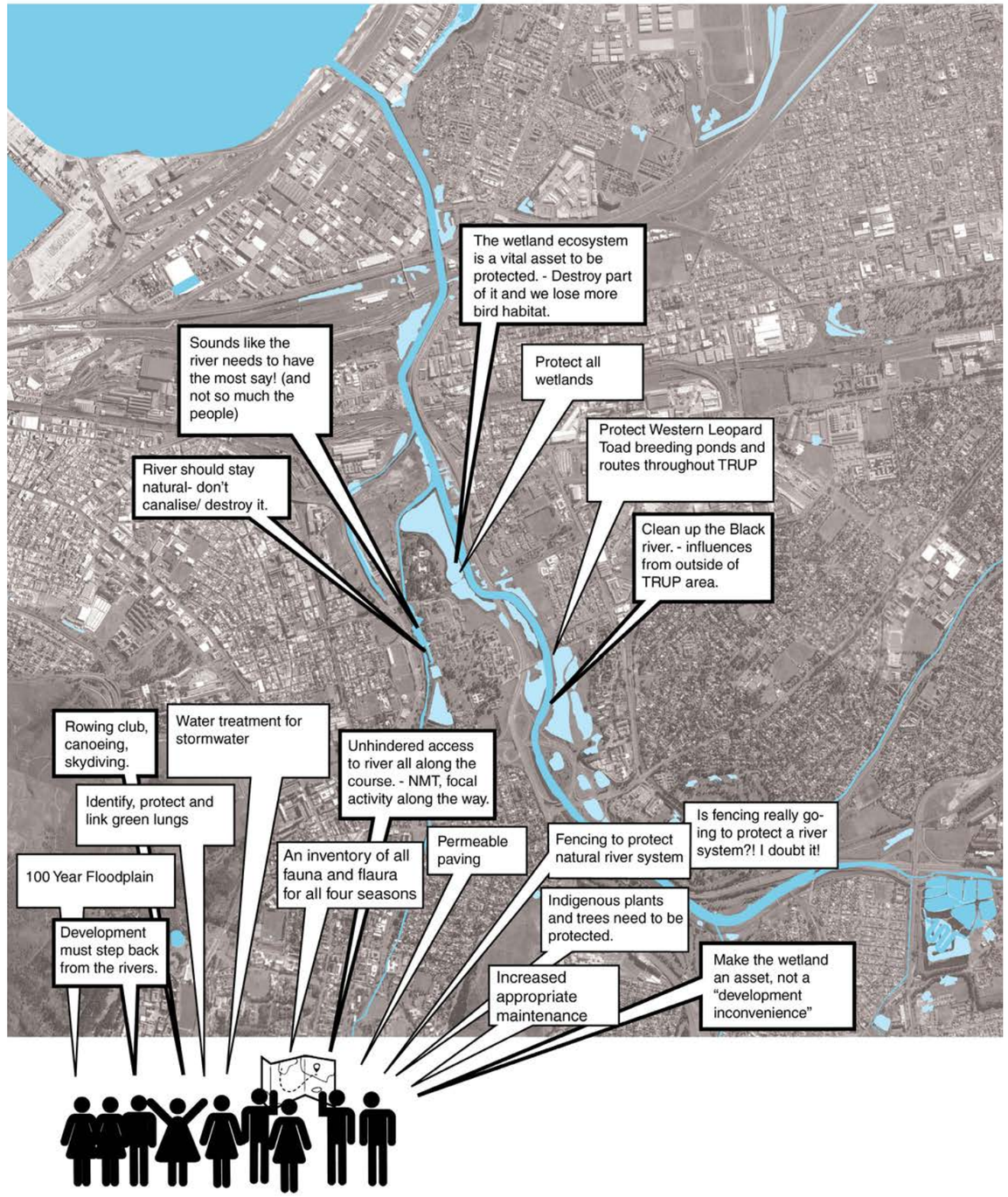

Canal
NEW AVOIDING LINE
Maitland Station
Market Square
Koeberg Road Station
SALT RIVER FARM
Salt River Junction
Municipal Abbattoirs
Ndabeni Station
Varsche Drift Railway Quarters
Liesbeek Riv.
Black Riv.
Liesbeek Park Sports Ground
Royal Observatory
Alexandra Institution
MUNICIPAL PROPERTY
Observatory Station
Valkenberg Mental Hospital
Oude Molen Mental Hospital
Pinelands Station
Dutch Reformed Cemetery
St Peters Cemetery
Cape Town University Medical School
Stuttafords' Recreation Ground
Jaggers' Recreation Ground
Football Fields
Caledonian Sports Ground
Mowbray Station
Raapenburg Station
MOWBRAY
LEASED
SPRINGBOK PADDOCK
WILDEBEESTE PADDOCK
Rhodes Recreation Ground
College of Music
Rosebank Station
Chemical & Bacteriological Laboratories
THE CAMP GROUND
RONDEBOSCH
Wash House
Pumping Station
Municipal Stables
FRASERDALE
St. Josephs College Marist Bros.
University of Cape Town Playing Fields
Rondebosch Station
THE SOCIAL FARM



6. Natural Systems Analyses



WHAT ABOUT THE NATURAL SYSTEM...?



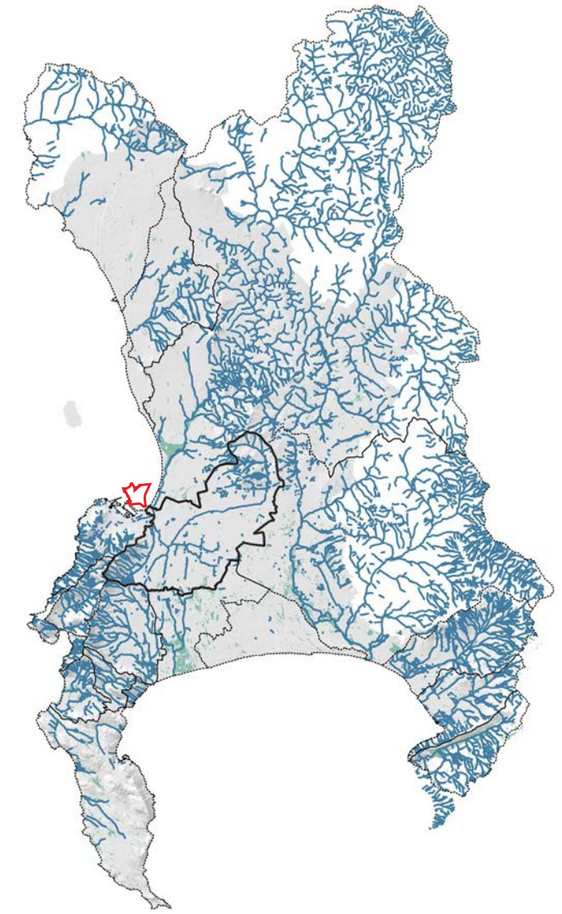
WHAT ABOUT THE RIVERINE SYSTEM...?

6.1. Study Area

The local TRUP site is impacted upon and affected by the conditions at catchment scale. Where applicable this report identifies potential catchment scale initiatives which would positively impact upon the environmental quality of the TRUP site area.

Situated within the winter rainfall area of the Western Cape, the site experiences dry hot summers, with the exposed areas of the site buffeted by the Summer South Easterly winds and the rain bearing North Westerly winds. The micro climate on the site is informed by the topography, elevation and orientation of the specific areas.

The boundaries for the Green Corridor Management Plan (GCMP) as defined in the tender terms of reference include all of the CoCT and WCG owned open space areas on both sides of the Black River within the TRUP study area as approved by the Client body on 19 May 2016 and 12 August 2016 when the boundary was expanded to include the Liesbeek River area as defined within the broader TRUP boundaries.



Salt River Catchment within Cape Town Metropolitan Area

notes .....

GREEN CORRIDOR MANAGEMENT PLAN STUDY AREA
Compiled by TKLA
KEY

scale 1:5000 at 60 x 80 cm
0 100 250 500

TRUP Boundary
Precinct Boundary
Study Area

Sources: Arial Photography 2015

6.2. Genius Loci

The sense of place (Genius Loci) of the site at both the metropolitan scale and at the scale of the site is informed by its location on the edge of a valley framed by two mountain ranges and traversed with seasonal river systems.

The micro climates within the TRUP site vary due to the variety of slope orientations and topographic relationships, with some areas more exposed to the climatic variations.

Historically farms were located along the Liesbeek and Black Rivers, taking advantage of the natural resources, water, soil and wind, for the irrigation, growing and milling of their crops. There is still evidence of this agricultural landscape, in the positioning of roadways, property subdivisions, historic buildings, mill remnants and the open grass embankments below Oude Molen and the sports fields adjacent to Liesbeek Parkway.

The character of the peninsula bounded by two river systems, lent itself to the location of the South African Astronomical Observatory and Valkenberg Hospital, both institutional precincts located within a park setting, on the then fringes of the city. These buildings as is Alexandra Hospital to the West of the Black River are located on the highest points within the landscape to take advantage of the views, open uninterrupted night sky in respect of the Observatory and the summer breezes in respect of the hospitals.

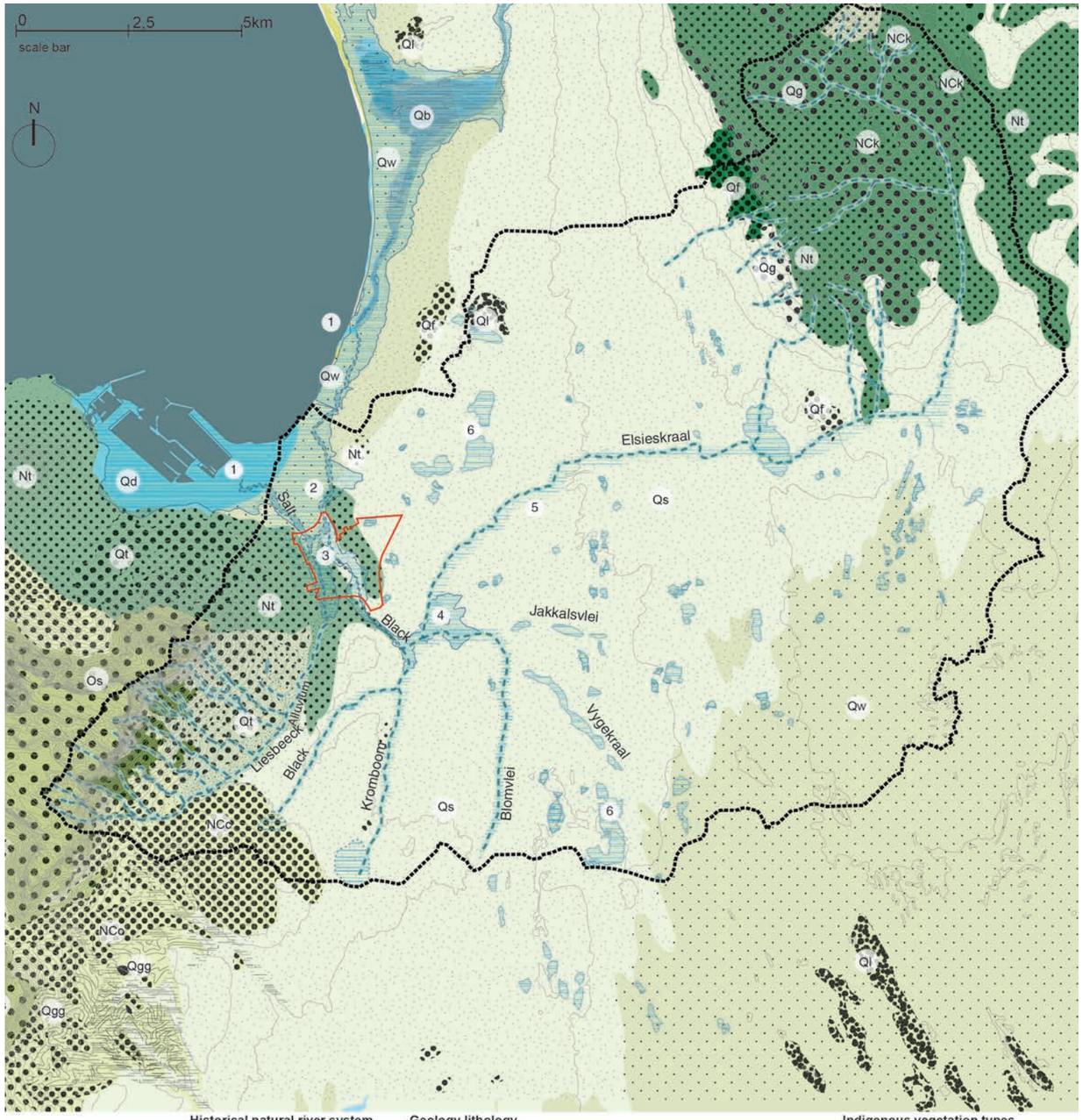
6.3. Geology

The underlying geology and resultant topography inform the spatial configuration of the broader site context, comprised of a large open low lying sand plain bounded by two mountain systems: the Tygerberg Hills to the East and Table Mountain to the West, the sources of the primary river systems, and coastlines to both the North and South of the broader system into which the rivers drain. The low lying Cape Flats sand plain with its underlying shales supports two Aquifer systems, the Newlands Aquifer and the Cape Flats Aquifer.

Within the TRUP site, lower lying shale intrusion subdivides the precinct into two river corridors that join where the rock intrusion terminates to form the Salt River and associated wetlands , resulting in a landscape of river corridors, wetlands, flood plains, embankments and plateaus. The historical river and water patterns consisted primarily of seasonal river systems and low lying perched 'kuils' that drained into the rivers and aquifers, terminating at the sea in an extensive estuary system with two shifting river mouths.

The TRUP site is bisected by the Liesbeek and Black River systems the character of each which was informed by the geology and vegetation that they historically traversed. The Liesbeek River originates on the Sandstone slopes of Table Mountain, historically passing through, Peninsula Sandstone Fynbos, Southern Afromontane Forest, Peninsula Granite Fynbos, Peninsula Shale Renosterveld and then ultimately draining into the historic Salt River estuary. The Black River System originated on the slopes of the Swartland Shale Renosterveld Tygerberg Hills, and within the Cape Flats Dune Fynbos terminating in wetlands traversing between the Peninsula Shale Renosterveld clad shale slopes, historically terminating in the Salt River Estuary.

notes .....



6.4. Geology and Topography

The localised shale outcroppings overlain with decomposed and alluvial soils characterise the TRUP river corridor. The Black river corridor with its wide flood plain is abutted by the Valkenberg, Maitland Garden Village and Alexandra Hospital ridges and steep slopes which afford views across the floodplains and rivers of the mountain and harbour. Direct contact with the river is further limited by the location of the M5 Freeway, which bisects the Black River Corridor. The shallower slopes below Oude Molen enable easier contact with the wetland edge of the river.

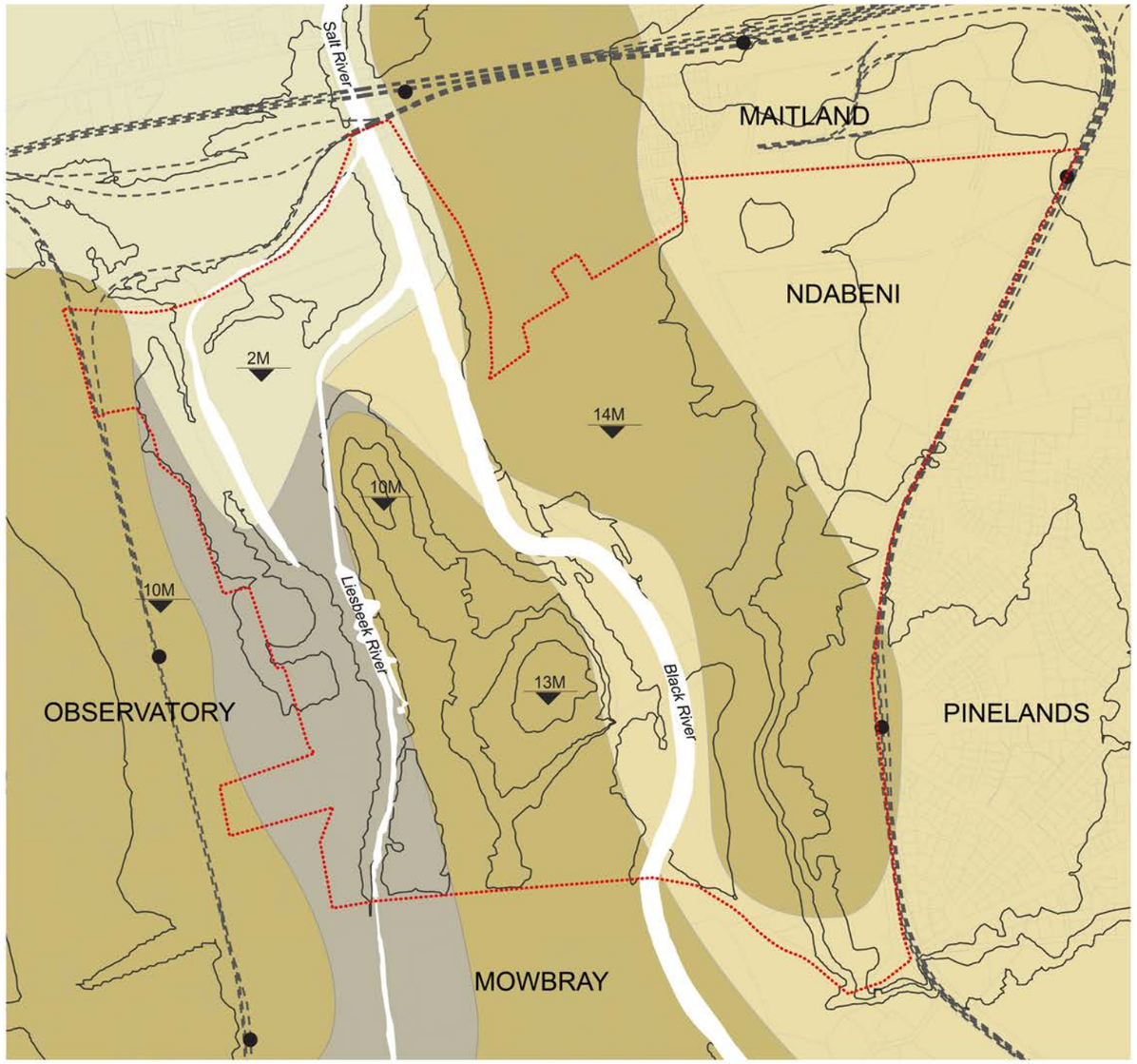
The Liesbeek River corridor is characterised by Valkenberg Hospital and Observatory Hill to the East and the Sandstone foothills of Table Mountain to the West. As a result of the gradual slopes and the nature of development within the Liesbeek Corridor, access to the river's edge is easier than that of the Black River.

The underlying geology in combination with the climate has informed the topography of the study area which contributes to its particular characteristics of:

- Panoramic views of Table Mountain and Signal Hill
- Elevated viewing opportunities across the river corridors from Alexandra Hospital, Maitland Garden Village, Oude Molen, Valkenberg Hospital and the South African Astronomical Observatory
- Scenic drive views along the M5 as it traverses the Black River corridor
- Valkenberg Hill and the Observatory Hill as raised plateaus have a visual and spatial presence within the lower lying floodplains of the Liesbeek and Black Rivers.

notes

Slope inclination



GEOLOGY AND TOPOGRAPHY
Compiled by TKLA
KEY

scale 1:5 000 at 60 x 80 cm
0 100 250 500

- TRUP Boundary
- [Qs] Sandy soil
- [Nt] Greywacke, phyllite, quartzitic sandstone
- [Qw] Unconsolidated white sand
- Alluvium
- 2 M contour

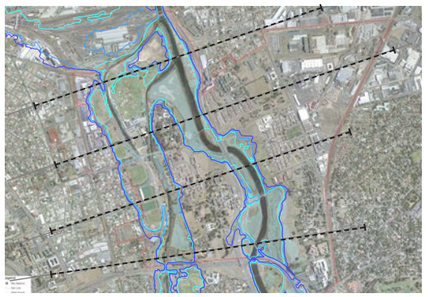
Sources: Redrawn from Geoplogical map 1990

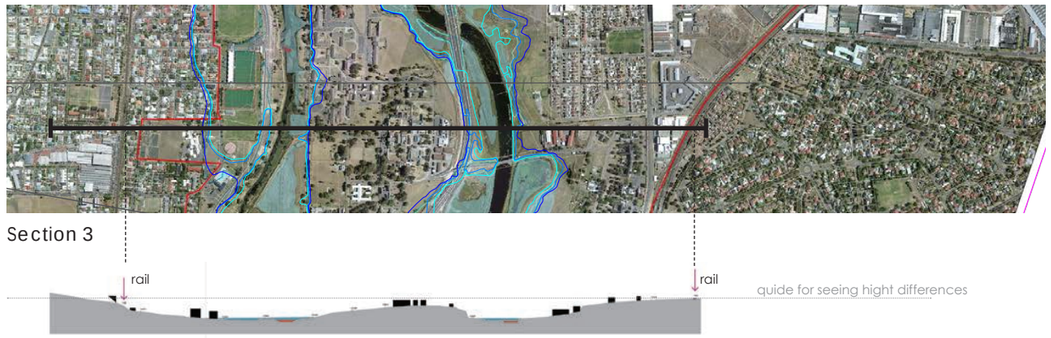
TRUP site

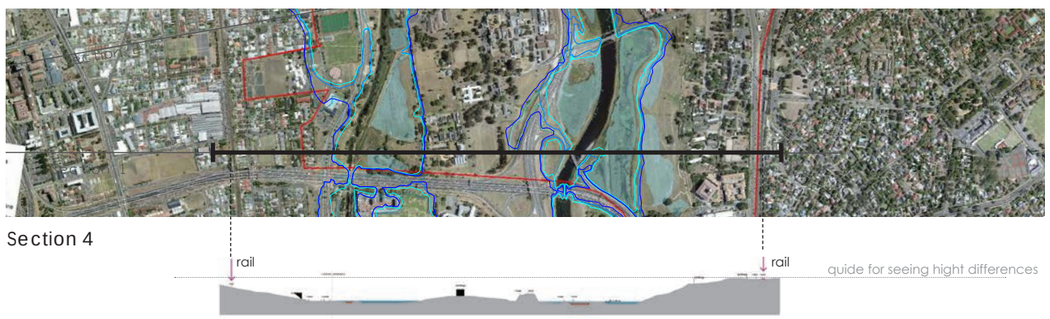
100 year flood line

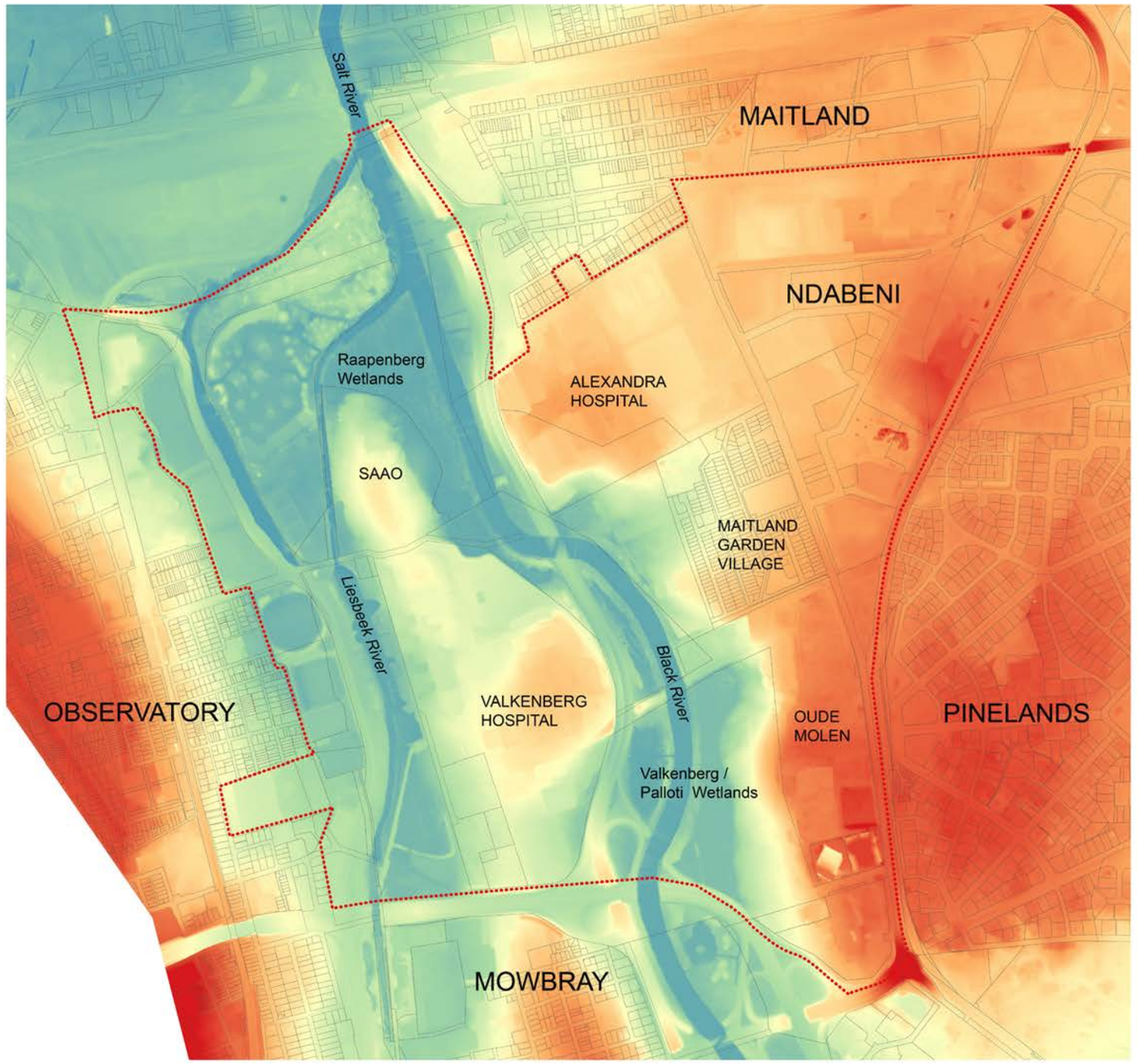
10 year flood line

Water bodies









TOPOGRAPHY

Compiled by TKLA

KEY

TRUP Boundary

0 M

4.75 M

9.5 M

14.25 M

19 M

Land Parcels

Sources: LiDAR 0.5 raster

scale 1:5 000 at 60 x 80 cm

0 100 250 500

6.5. Hydrology

The hydrological systems have been altered into a predominantly canalised seasonal water system. As the catchment area was developed a system of concrete and earth canals were constructed to facilitate drainage of development areas, this includes the canalisation of large sections of the rivers that transverse urban settlement. This resulted in a reduced naturalised river system, with the natural streams restricted to the mountain slopes and constructed river systems located primarily within the TRUP site.

River Systems

The Salt River Catchment is the third largest in the City of Cape Town with an area of 25 000 ha. The three major rivers that make up this catchment are the Liesbeek, Black and Elsieskraal River. These three rivers join to form the actual Salt River (CCT, 2012a). Historically the Salt River, Black River and the Diep River formed a substantial estuary located where Paarden Eiland exists today. Presently the Salt River is a confined, concrete canal that drains towards Table Bay, south of the Diep River outlet at Paarden Eiland (CCT, 2012a). As such, the estuarine function has largely been lost.

The Liesbeek River in the past entered the sea through Paarden Eiland. Urbanisation has resulted in the lower reaches of this river being canalised and redirected to drain into the Black River, consequently the Liesbeek River has instead become a major tributary of the Black River (CCT, 2012a).

The Liesbeek River is composed of seasonal and perennial streams that originate on the Eastern slope of Table Mountain. Due to increasing densification impact on the river increases with distance from the mountain (CCT, 2012a).

Downstream of Kirstenbosch, the Liesbeek River is highly canalised where this portion of the river receives run-off from suburban gardens and other associated urban activities. There have been efforts to improve canalisation through the use of "weirs, and installation of boulders in broken areas of the canal floor" (CCT, 2012a, p. 118). The Liebeek River enters the Black River via an earth channel below the N2 Bridge close to the River Club Driving Range (CCT, 2012a).

The Black River is the other important water course in the study area. It was previously a seasonal river. However, with the addition of run-off from Borcherd's Quarry Waste Water Treatment Works, Athlone Waste Water Treatment Works and from storm water from various urban settlements, the Black River has become a perennial system (CCT, 2012a).

The Vygekraal and the Elsieskraal Rivers flow into the Black River, downstream of the Kromboom River Confluence (CCT, 2012a). The water that enters the Vygekraal River is contaminated with storm water run-off. The Elsieskraal River originates in Durbanville where it can be observed that after the N1 the river is concrete canalised, the river enters the Vygekraal downstream of Langa Road Bridge and the combined systems merge with the Black River canal", (CCT, 2012a, p. 119).

Tidal Patterns

The canalisation of the Salt River has hampered tidal flushing (CCT, 2012a), thus completely eradicating the estuary environment. Cape Town harbour experiences approximately two high tides per day. Analysis of the long-term tidal record also indicates water levels at the harbour are always between -1.4 and +1.4 a.m.s.l.

The water quality data was provided by the CoCT on conductivity and sampled from a point upstream side of the TRUP area on the Black River (station NR07 on footbridge to Alexandra Institute). This sampling indicated no brackish influence of the sea, although not necessarily taken with spring tide. Mixing of salt and freshwater would be a natural characteristic of an estuarine area. However, the high level of modification obviously prevents this from taking place.

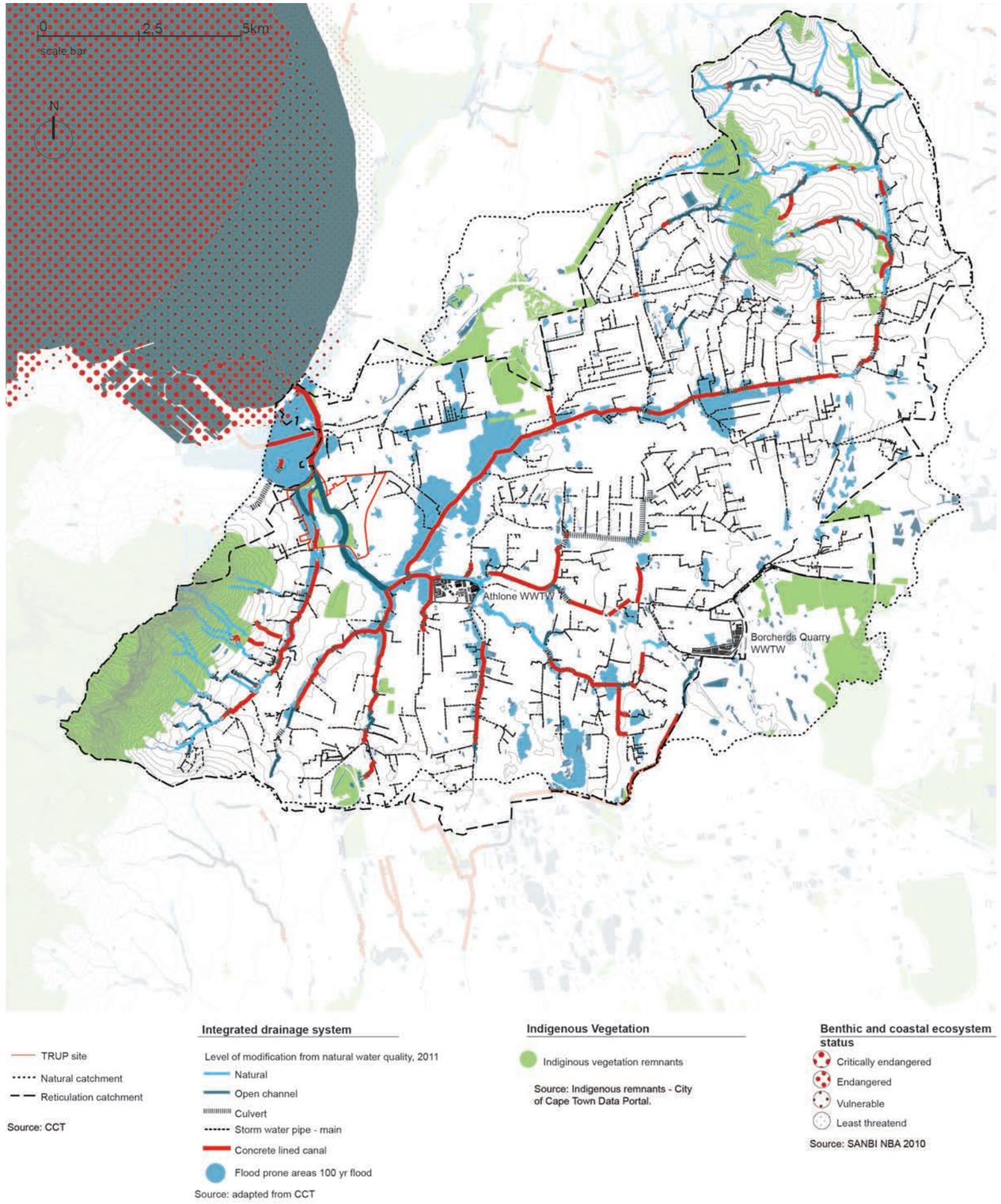
In addition to the above, a final observation can be made with reference to the type of vegetation and fish found in the river. Interviews with fishermen indicated that freshwater fish are caught in the canal, such as Carp and Barbel.

Groundwater

There are three main aquifers in the Salt River Catchment. The Newlands Aquifer is located at the eastern foothills of Table Mountain, and underlies the Liesbeek River and parts of the Black River sub-catchments. The area above the 120m contour line is the recharge zone while the area between the 120m contour line and Camp Ground Road is the aquifer zone from which groundwater is extracted" (SRK, 2013:33). The high average annual rainfall in the microclimatic zone serves well in recharging the aquifer, and further downhill, water is able to be extracted via boreholes or springs, most notably by the South African Breweries. Due to this, the future use of the aquifer might be relevant for base flow in the TRUP area.

The Cape Flats Aquifer is extensive, and underlies much of the Salt River Catchment. The quality of the groundwater is generally good, but the quantity of available water differs across the aquifer. In general, the aquifer is not considered to be a significant water supply source. The Malmesbury Aquifer "forms the basement to the study area" (SRK, 2013:33). It is exposed at the western and northern tips of the catchment, and is associated with poor quality water and low yields.

notes .....



6.6. Water Quality Impact on Recreation

For recreational purposes, *Escherichia coli* as an indicator of pathogens is important, as well as is the risk of algal contamination due to eutrophication and litter.

Filamentous algae occur, which are not toxic. There are no green and blue algae that produce toxins (Input C. Haskins in Contextual Analysis Report, 2016).

The current City of Cape Town's policy is that swimming in fresh surface waters should be avoided (Verbal input River Study Workgroup meeting 2 on 5 May 2016). However, less intensive contact, such as rowing or paddling, may be allowed. There are no strict regulations for these less intensive contact sports.

The *E. coli* limit for contact recreation, which is about 400 counts/100 ml in South Africa (DWAF, 1996a) is regularly transgressed, but also regularly not transgressed in the monthly point samples taken.

The E. coli data from October 2009 to October 2015, show that the *E. coli* levels are sometimes below 400 counts/100 ml (official guideline for contact water quality) and in continuing months below 1000 counts/100 ml (which is also not really a problem as the reaction of humans to bacteria – for which *E. coli* is an indicator - is exponential rather than linear. 1000 counts/100 ml is also the general water quality standard 2004 for effluent of WWTWs.) While older data show high effluent *h*concentrations in Athlone, these days disinfection takes place (interview K. Samson, June 2016). Both Vygekraal and Elsieskraal have similar high *E.coli* counts. No clear seasonal pattern can be recognised.

Other pollutants which are not being monitored could also be a problem (pesticides, heavy metals), but are not the major part to be addressed by the options considered.

No foam or odour problems have been observed in the river according to the role players consulted and during field visits by the team.

6.7. Water Quality Impact on Ecology

Indirectly, the recreational use is also influenced by the ecological functioning of the river.

For the functioning of the ecology the combination of oxygen levels and eutrophication is important. The nutrient levels (phosphates and nitrates) are too high, which is part of the reason for low oxygen levels. Higher oxygen levels may also be part of the solution; denitrification can take place with higher oxygen levels.

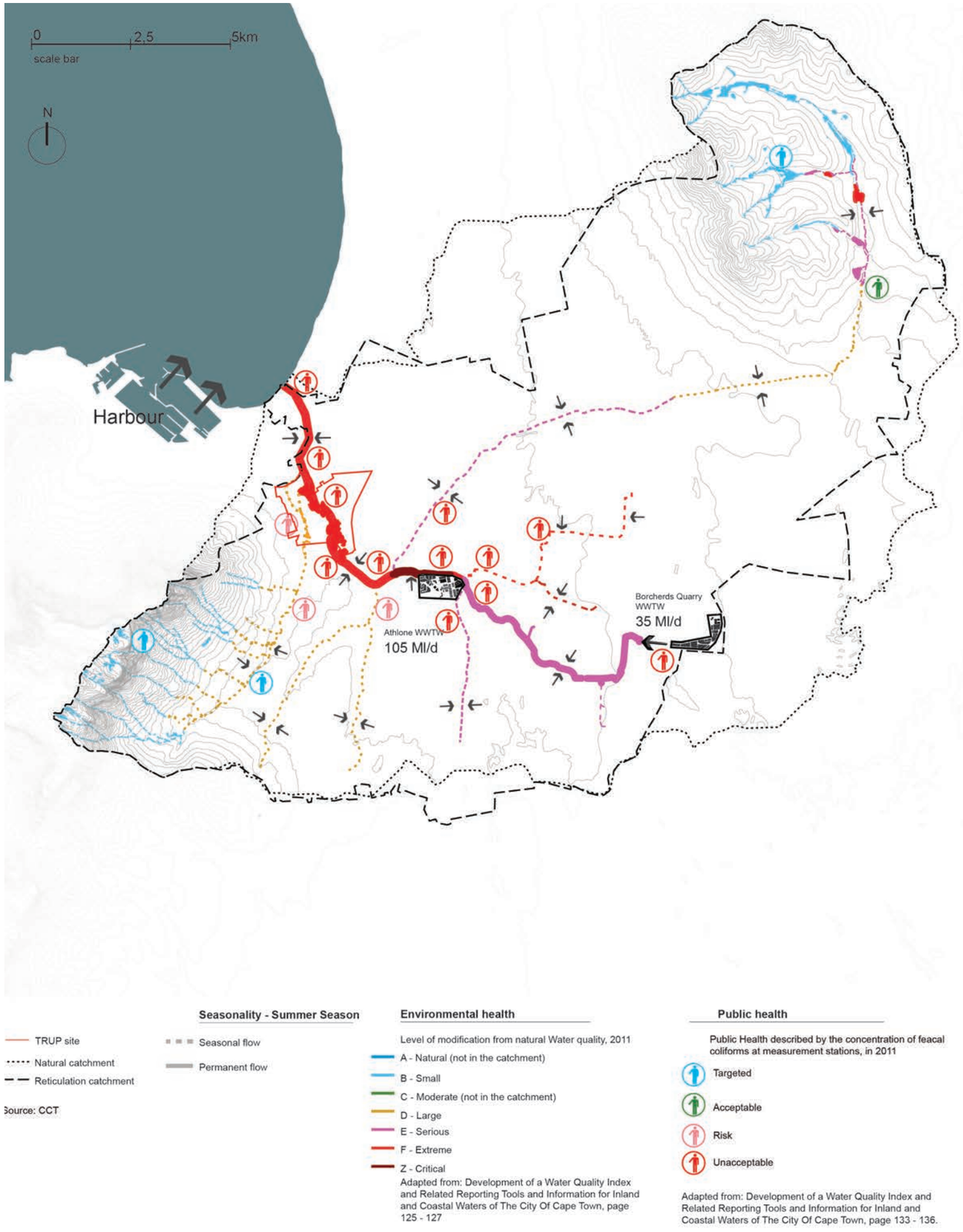
Of main importance in the analysis of the eutrophication problem is that:

The oxygen saturation levels are fluctuating with lowest levels in the summer months, often less than 30%. Oxygen saturation should ideally be at least 80% for good ecological functioning (DWAFc, 1996), while the levels at Raapenberg Road bridge (NR06) are in the summer months often less than 30%. The occasional occurrence of oversaturation (>100%; 2 incidents in 2008, 1 in 2012) could be an indication of hypertrophic circumstances, but could also be measuring mistakes.

The river water is eutrophic and has algal and high water hyacinth growth.

The nitrate concentrations are generally lower than 10 mg/l although since 2011 have deteriorated upstream of the Athlone WWTW. The total inorganic Nitrogen and total inorganic Phosphorus are in the same order of magnitude, while the stages from oligotrophic to hypertrophic have far higher (factor up to 100) limiting concentrations for Phosphorus rather than for Nitrogen. For example, for hypertrophy, which gives a big risk of algal blooms, summer concentrations of inorganic Phosphorus have to be above 0.25 mg/l and above 10 mg/l for inorganic nitrogen. For eutrophic conditions, the concentration trigger levels are respectively 0.025-0.25 for P combined with 2.5-10 for N (Dallas & Day, 2004). Nitrogen removal in WWTWs to a high percentage is also less complicated rather than Phosphorus. For upstream measurements in the TRUP catchment area it seems therefore more logical to concentrate on nitrogen reduction. The Athlone WWTW has a positive influence on eutrophication levels; upstream of the WWTW water quality is worse than elsewhere along the river.

notes .....



6.8. Morphology, hydrology and physical constraints of the Black River

The TRUP area is very flat; the bottom of the start of the Salt River Canal is as high as the top end of the TRUP area in the Black River (about 90 cm above mean annual sea level). Therefore there is basically no hydraulic head to keep the river flowing in times of low flows. The entrance of the Salt River Canal functions as a 'weir'. The gradient over the TRUP side itself is only 0.5 %, if not completely flat.

The dry weather flows are currently being fed by the two upstream WWTW's namely: Athlone and Borcherd's Quarry, which jointly contribute a flow of 1.6 m3/s.

Both WWTW's are jointly contributing a flow of 2.25 m3/s. However, the City of Cape Town intends to reuse and reclaim as much effluent of the WWTW's as possible, and this will be realized very probably within 10 years, therefore urban planning should assume a scenario of flows being brought back to lower levels. The City intends to bring the flows back to 'natural flows', but the study for this will still need to be done, and it is probably that in this study not only the natural situation of flow hydrology will be considered (which is probably very low flows) but also the impact the change in flow will have on the other drivers of ecological functioning of the river: water quality and morphology.

The flood flows are quite considerable, with the design flows entering the TRUP area for a 1:10 year return period estimated to be 140 m3/s and for a 1:100 year return period 230 m3/s. The 1:2 year flood which is considered important for morphology is estimated to be 100 m3/s (Derived from hydrological model data SRK, 2012). The flow data at Glamis and in the Elsieskraal, as provided by the City for 2004-3005, have been studied but do not seem to make sense, therefore have not been analysed.

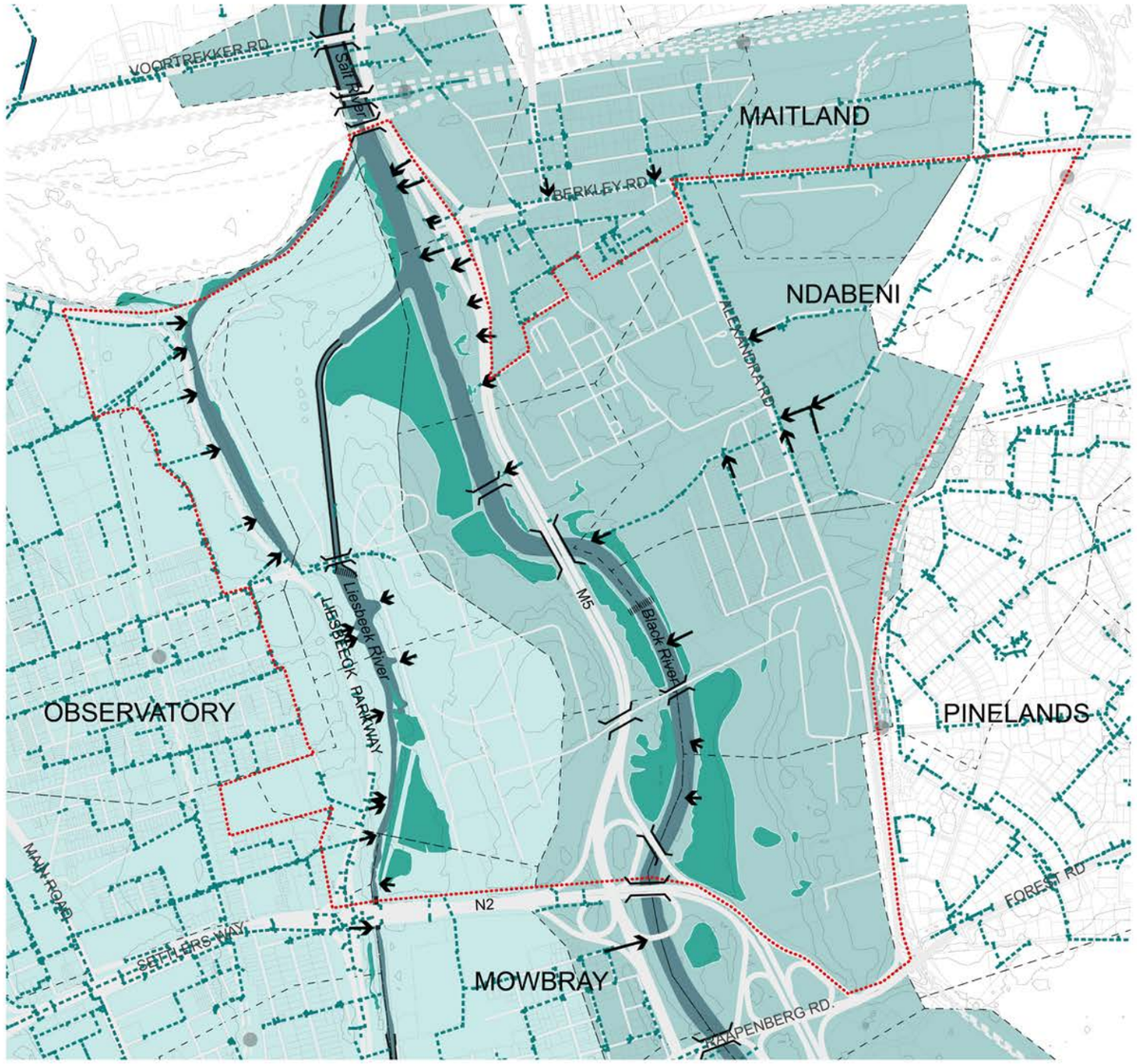
The river banks are currently steep but stable; no particular high level of erosion or sedimentation was observed.

Dredging is regularly done upstream of the TRUP site, downstream of the confluence with the Elsieskraal over a 400m stretch. As there are in terms of quantity of silt and sediment no clear problems of erosion or sedimentation in the Black River within the TRUP area, we have assumed the dredging maintenance to be continued upstream.

6.9. Storm Water System

The majority of the storm water outlets feed directly into the rivers, with no litter or sediment traps which would ameliorate the litter entering the river system. There are no storm water recharge or detention areas within the adjacent suburbs, the storm water discharges into the river corridor at concentrated points, resulting in localised flooding.

notes .....



River Corridor Management Plan

STORMWATER INFRASTRUCTURE

Compiled by TKLA

KEY

scale 1:5000 at 60 x 80 cm

0 100 250 500

- TRUP Boundary
- Wetlands
- Salt-Vygekraal Primary Catchment
- Liesbeek Primary Catchment
- Concrete Lined Channel
- Open Channel
- Storm Water Pipes
- Weir
- Storm Water Inlet
- Existing Brdige
- Secondary Catchments

Sources: Wetlands Blue Science October 2016, weirs RHDHV, other CCT.

6.10. Fresh Water and Wetlands Information

The main freshwater features within the TRUP site are the Liesbeek and Black Rivers. Associated with the rivers are a number of wetland areas that comprise remnant floodplain wetland and artificially created and storm water dominated wetlands.

Of the wetland areas within the site, the Raapenberg, Vincent Pallotti and Valkenberg wetlands are considered to be the most important, as remnants of the Black River floodplain wetland area. The ecological condition of these aquatic ecosystems range from being moderately to largely modified for the wetland areas and largely to seriously modified for the rivers.

The ecological importance and sensitivity of these aquatic ecosystems is deemed to be moderate to high in general with only the Black River being low to moderate.

The Raapenberg, Valkenberg and Vincent Pallotti wetland complex is considered to have a high sensitivity. The remaining valley bottom and floodplain wetland areas and riparian zones of the Liesbeek and Black Rivers, including the old channel of the Liesbeek River, are considered to be of medium sensitivity. Minimal development should take place within the more sensitive wetland areas and the recommended buffers.

The water quality in the two river systems is highly variable and is linked to the seasonal flow variability. The quality of the water in the Black River is significantly more degraded than in the Liesbeek River. A trend of improving water quality is evident in the rivers over the past 20 years.

The proposed development of the site is likely to have an impact of low significance on the aquatic ecosystems on the site, with a potential for a positive impact. The following are proposed to improve the ecological condition of the aquatic features within the site:

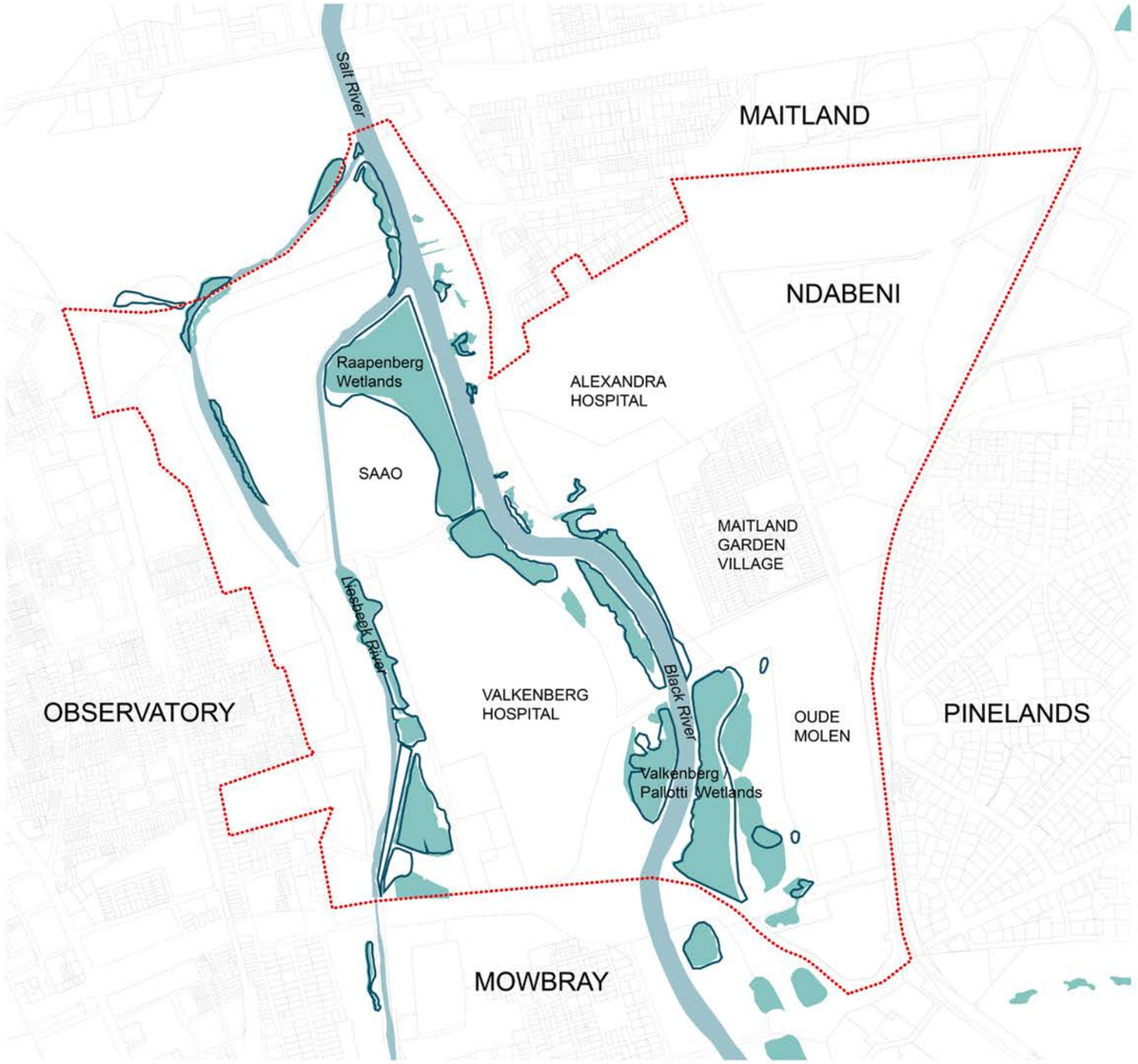
The impact of storm water runoff from the surrounding developed areas into the aquatic features should be mitigated. Where possible, litter traps should be constructed to reduce litter entering the rivers. The functionality of the rivers and wetland areas should also be enhanced.

Invasive alien vegetation within the aquatic ecosystems and their buffer areas should be removed and these areas kept free of alien invasive plants;

A buffer area of minimum 32m should be maintained adjacent to the delineated edge of the aquatic features;

The river corridors and their associated wetlands areas represent key corridors for the movement of aquatic biota. Connectivity within these corridors within the site should be maintained or restored where possible. While the connectivity along the Black River within the site is still largely intact, Observatory Road and the canalised section of the lower river have significantly impacted on the connectivity of Liesbeek River. Rehabilitation of the lower Liesbeek River should be undertaken according to an approved rehabilitation plan.

notes



River Corridor Management Plan

WETLANDS DELINEATION

Compiled by TKLA

KEY

scale 1:5 000 at 60 x 80 cm

0 100 250 500

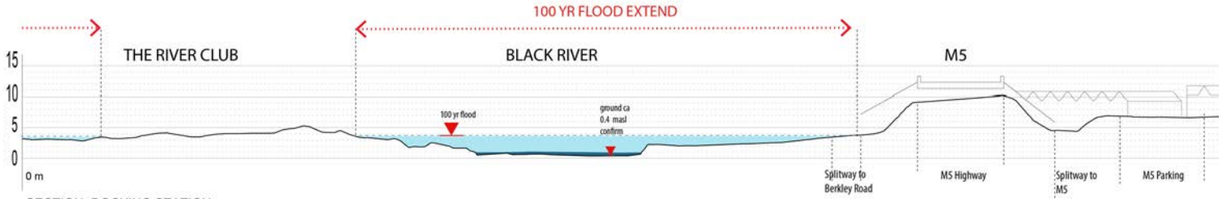
TRUP Boundary

Wetlands CoCT

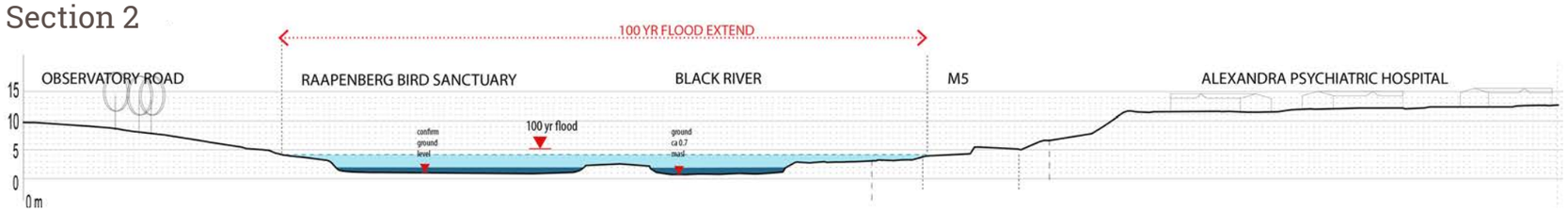
Wetlands Groundtruthed October 2016

Sources: CoCT, Blue Science 2016

Section 1



Section 2



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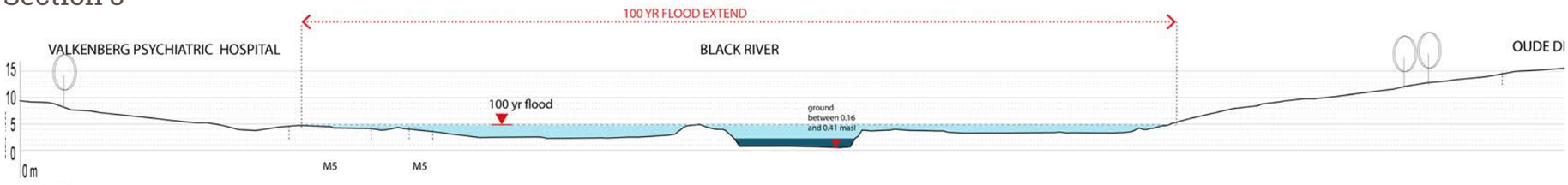

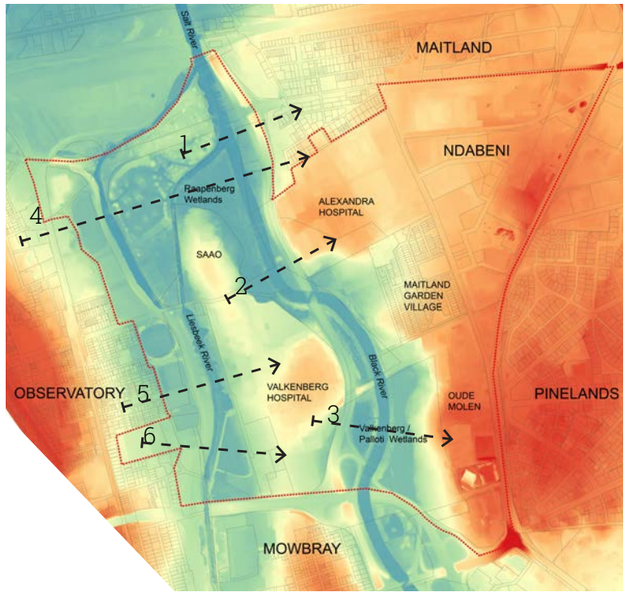

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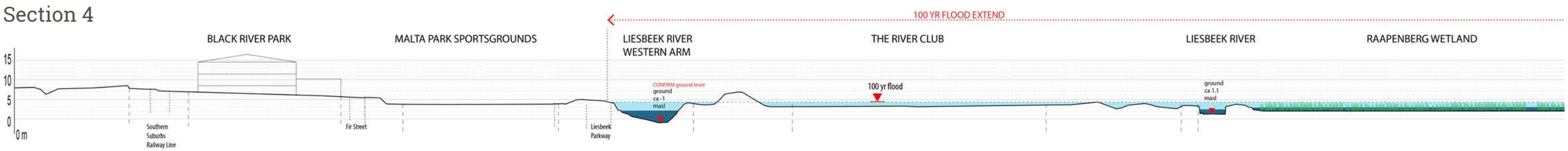

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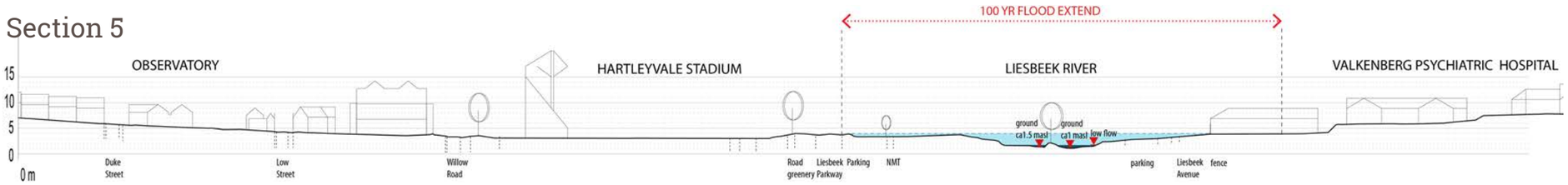

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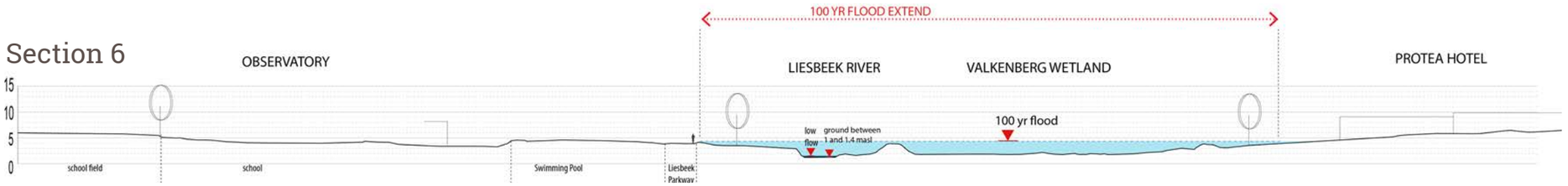


6.11. Biodiversity

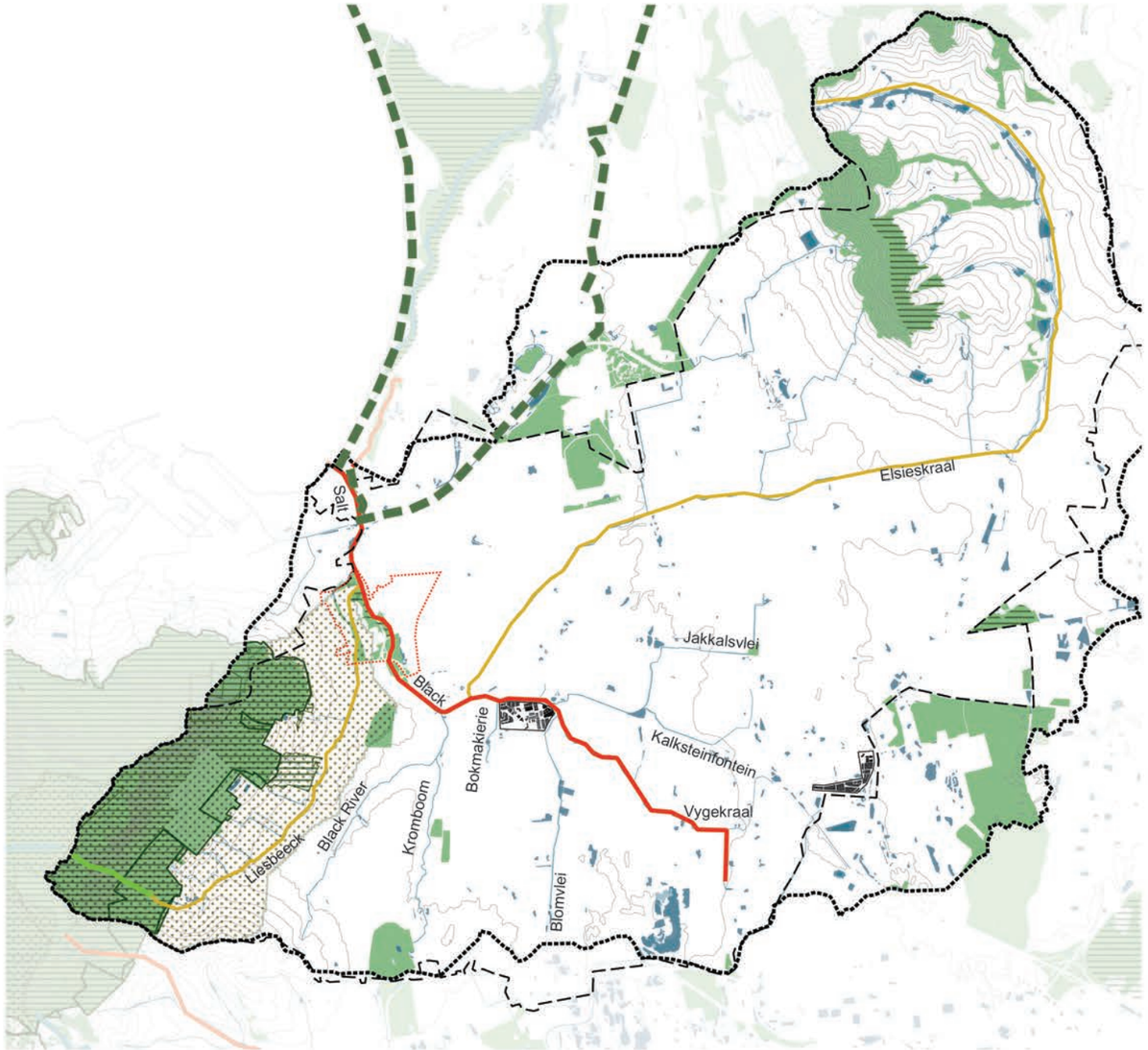
The Salt River Catchment includes three formally protected areas Table Mountain National Park (partially), Tygerberg Nature Reserve (wholly) and Rietvlei Nature Reserve (partially).

The remainder of the catchment's biodiversity assets consist of critical biodiversity areas (CBAs) in various categories, including some extremely high value areas which are considered to be completely irreplaceable elsewhere within the CoCT.

The south east section of the Table Mountain National Park is also considered to be a 'fish sanctuary' in line with the National Freshwater Ecosystem Priority assessment (2012). Sadly, the canalisation, poor water quality and presence of alien fish species limit the range of indigenous fish species.

The Department of Water and Sanitation (2005) has reported that the lower Liesbeek, Elsieskraal and Black Rivers are dominated by alien fish, such as carp, catfish and tilapia. Competition for food or habitat and predation has caused the near disappearance of indigenous *Cape galaxias*, with impacts being most significant from the M3 highway onwards with the impact compounding the further away from the mountain the watercourses flow.

notes .....



River Corridor Management Plan

BIODIVERSITY AND PROTECTION LEVELS

Combiled by TKLA

KEY

scale 1:100 000 at 250 X 330 mm

0 1 2.5 5km

- TRUP Boundary
- Natural Catchment
- Reticulation Catchment
- CoCT Biodiversity Network
- Wetlands
- Waste Water Treatment Works

Rivers Present Ecological State

- Class E or F - Seriously/ Critically Modified
- Class D - Largely Modified
- Class C - Moderately Modified
- Class A or B - Unmodified / Largely Natural
- Other water courses without indication of level of modification

Protection Levels

- World Heritage Site
- Natural Reserve
- Biosphere Reserve
- Fish Sanctuary

Source: Critical Biodiversity Areas for CoCT: SANBI 2016, Ecological State of Rivers: SANBI 2012, Fish Sanctuary SANBI 2011, Protected Areas SAPAD 2015.

6.12. Biodiversity Network TRUP Site

Situated within the Core Region of the Greater Cape Floristic region, as part of the Fynbos biome the study area has elements of both the West Coast Renosterveld bioregion and the Southwest Fynbos bioregion, both bioregions display high numbers of highly threatened species. Only two areas within the site have been identified as Critical Biodiversity areas, each being mapped as Irreplaceable Consolidation Sites, with large parts mapped as 'protected in perpetuity', these have signed Biodiversity Agreements with Cape Nature.

The site has a long history of disturbance and consequently there is very little natural vegetation in good condition, with dominantly disturbed remnant habitats.

notes .....

River Corridor Management Plan

CRITICAL BIODIVERSITY AREAS AND PRESENT ECOLOGICAL STATE OF RIVERS

Combiled by TKLA

scale 1:100 000 at A1

0 100 250 500

KEY

- TRUP Boundary
- Wetlands
- Protected in Perpetuity
- CBA 1d
- OESA
- Other Natural Vegetation
- Class D: Largely Modified River
- Class E or F: Seriously / Critically Modified River

Sources: Biodiversity Network for CCT SANBI 2016, SANBI 2012

River Corridor Management Plan

BOTANICAL SENSITIVITY

Combiled by TKLA

KEY

scale 1:100 000 at A1

0 100 250 500

- TRUP Boundary
- Wetlands
- High Sensitivity
- Medium Sensitivity

Sources: Nick Helme 2016, Wetlands Blue Science Oct 2016

NOTE: MAP AMENDED ON FEBRUARY 10TH, 2017

River Corridor Management Plan

FAUNAL SENSITIVITY

Compiled by TKLA

KEY

scale 1:5 000 at 60 x 80 cm

0 100 250 500

- TRUP Boundary
- High
- Medium
- Wetlands

Sources: Helme N. 2016, Wetlands - Blue Science 2016

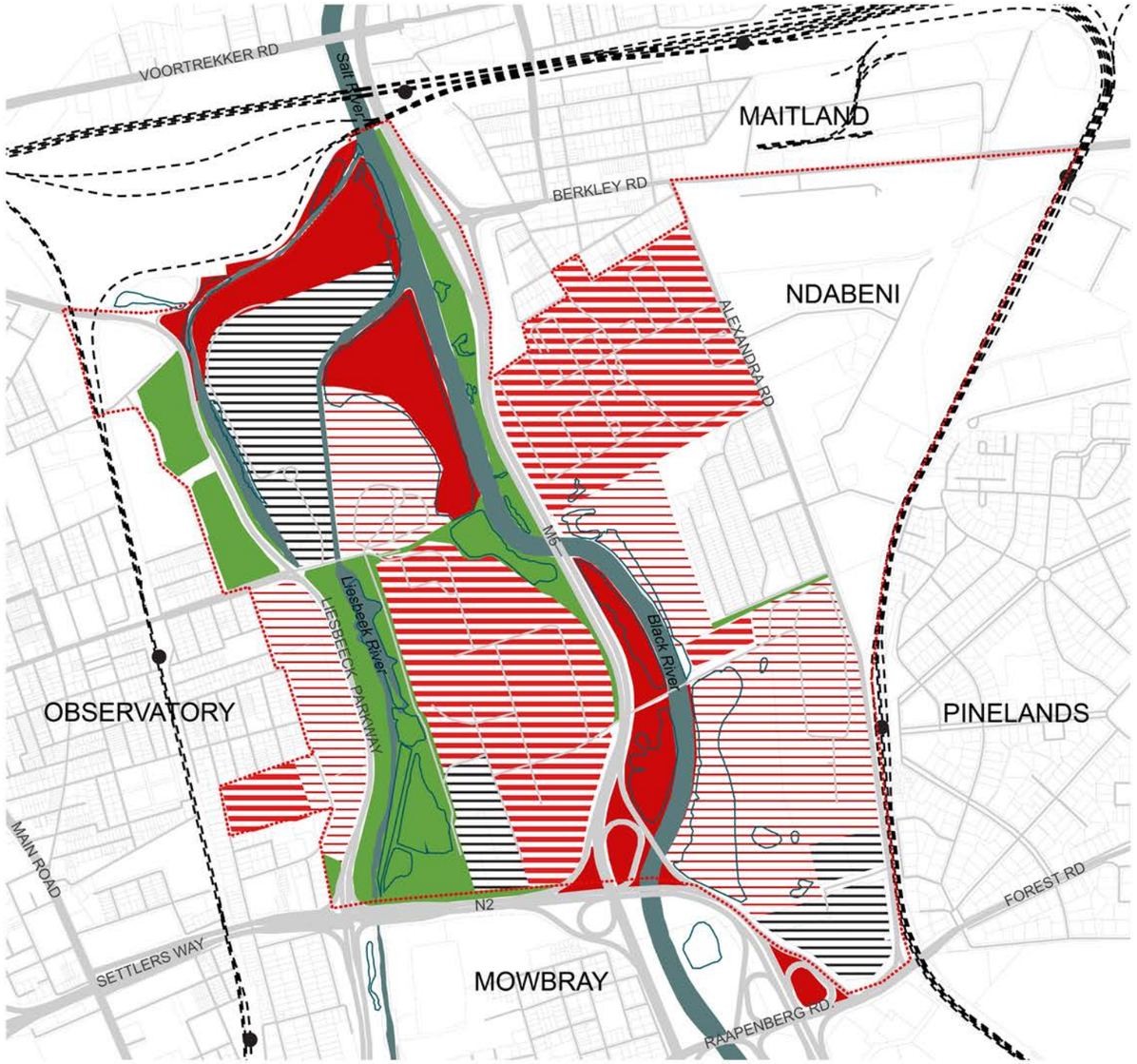
7. Landscape Systems Analyses

7.1. Accessibility of the Park

An analysis of the current perceived and physically accessible TRUP Park illustrates that the extent of easily accessible park is limited to portions of the Liesbeek River in front of Valkenberg and the Wild Fig, the North Western Sports Fields on the Western side of the Liesbeek Parkway and limited portions of the Black River. This is due to limited accessibility across both the Black and Liesbeek Rivers, the fences around the Valkenberg, Observatory, River Club, the Western boundary of the sports precincts along the Liesbeek Parkway, fences around Alexandra Hospital and Maitland Garden Village (Forensics) as well as the impenetrability of the wetlands.

The perception of the accessible park is more extensive than its actual area measured in square meters, due to its location within the river corridor, the visibility of Table Mountain from most of the site, the low development footprint of the Valkenberg, the SA Astronomical Observatory and River Club sites, as well as the abutting sports fields and grass embankments which extend the perception of the park-like landscape.

notes .....



River Corridor Management Plan

ACCESS OF OPEN SPACE

Compiled by TKLA

KEY

- TRUP Boundary
- Not Accessible
- Public Institution with Controlled Access
- Public Institution with Restricted Access
- Private Property
- Access without a gate/ fence
- Wetlands

scale 1:5 000 at 60 x 80 cm

0 100 250 500

Fig.6 Access of Open Space

7.2. Park Land Use Patterns

Various landscape zones within the TRUP corridor were identified including wetlands, grass embankments, maintained gardens, agricultural areas, tree groupings, unmaintained grassy waste areas, sports fields, golf courses and driving ranges etc. These zones have varying ecological, recreational and heritage opportunities within the TRUP site. They are discussed as separate landscape domains for the purpose of identifying them, however it is understood that they do not exist in isolation but in various relationship groupings depending on their location.

- The **wetlands** provide habitats, water filtration and recreational opportunities as well as serve as a reminder of the Heritage Landscapes that prevailed within the TRUP site before Colonization of the Cape. They also present an educational opportunity within TRUP, in respect to teaching and training.
- The grass embankments provide limited habitats however they do have a recreational role, currently providing areas for walking, horse riding, and passive recreation. They also provide a visual heritage role, as the foreground to the Historic precincts that bound the river corridor.
- The institutional gardens within the Observatory and Valkenberg precincts contribute to the tree canopy within the River Corridor providing visual and aesthetic appeal as well as bird habitat. The Observatory gardens harbour and maintain the protected Moreae Species.
- The agricultural areas within the Oude Molen precinct provide land use diversity as well as urban agricultural opportunities for sustainable living. The tree groupings and feature trees are predominantly located within the Liesbeek River corridor and within the development precincts, there are few trees along the banks of the Black River (within TRUP). The tree species are predominantly exotic species, with Salix along the river banks and Gum and Pine trees dominating the Shale outcroppings.
- The Sports fields located along Liesbeek Parkway serve as practice and event fields (Hartley Vale) for local and metropolitan teams. The practice fields lack support infrastructure and active surveillance. The current public accessibility to Hartleyvale is limited, with no public transport system located in LBP.
- The Golf Course (Mashe Course) in front of Maitland Garden Village, has limited public access and does not act as a positive threshold between the Village and the Green Corridor.

notes .....

River Corridor Management Plan

OPEN SPACE CATEGORIES

Compiled by TKLA

KEY

scale 1:5 000 at 60 x 80 cm

0 100 250 500

- TRUP Boundary
- Community Parks
- Golf Courses
- Sport fields
- Educational Grounds
- Industrial areas - open space
- Parking
- Other Open Space
- Institutional Gardens
- Productive Gardens
- Swimming Pools
- Wetlands
- Trees
- Precint Boundary

Sources: open space categories land use study 2007 and own mapping from Arial photography 2015, trees own mapping, wetlands Blue Science October 2016, other CoCT

Fig.7 Open Space Categories

7.3. Park Interfaces

The precincts adjacent to the Green Corridor pre-sent differing and particular threshold interfaces, consisting of a combination of landscape typologies. These thresholds are referenced to the adjacent built infrastructure.

The land uses and resultant landscape typologies within the River Corridors have a direct relationship to the underlying geology and topography in the immediate area. The park interfaces are discussed herein in relation to the adjacent precincts.

5. Liesbeek/Observatory Threshold

Located within the Historical Flood Plain, this area was reserved for sports fields, which could accommodate the seasonal flooding. Remnants of the old farm tree avenue structures are still evident within the road reserves. This area provides a green open foreground to views of the mountain from the Liesbeek River edge, however its current structure and security fencing prohibits direct access for the Observatory community into the Liesbeek River Corridor. It there-fore acts as both a facilitator for sporting opportunities for the local and broader community and as a divisive element for the local community restricting their access to the Liesbeek River.

6. Valkenberg Hospital / Liesbeek Precinct Threshold

Located along the Eastern edge of the Liesbeek River between the Station Road extension bridge and the N2, The current status of this edge, is as an access route to the Wild Fig and the Chinese School. It also serves as a buffer edge (reinforced by the security fencing around the Hospital) be-tween the Hospital and the Park, with ac-cess between them, There is no active sur-veillance of the park edge all the hospital buildings orient away from the river view. In addition access to this grassed edge of the river is limited to the Station Road extension bridge crossing. These factors contribute to a landscape which has limited access, does not feel very secure and has limited ecological value, with its parallel lines of fence, road and grassed embankments edging steep river embankments. Currently Historic visual vistas and pedestrian connections across the river no longer exist.

7. Valkenberg Hospital Eastern threshold onto the M5 and the Black River

The Valkenberg Hospital is both physically and visually separated from the Black river, due to the parallel barriers, of the Black River Park Way, the steep slope, and the boundary fence. Due to the topography potential views would be of the wetlands below Oude Molen and towards the Oude Molen precinct situated within the 'natural' landscape of the green corridor.

Currently this edge has no direct contact with the Black River, and all pedestrian links are via the pedestrian bridge which serves Valkenberg.

8. Oude Molen Threshold

Situated along the ridgeline on the Eastern embankment of the Black River the threshold zone abutting the Oude Molen precinct is afforded panoramic views across the Black River Corridor towards Table Mountain and Devils Peak. The wide open grassland presents a pastoral landscape against which the Heritage buildings and clumps of trees are read. Spatially the fence line and the orientation of the buildings along the boundary form a divisive barrier between the Oude Molen precinct and the Black River Corridor. Access into this precinct is limited and surveillance of the open space is not apparent. The landscape character of the threshold is pastoral along the ridge line and on the slopes, becoming more natural and wild as it reaches the rivers wetland edge. However the M5 visual intrusion and noise factor detract from the potential inner city natural park character of this precinct. It also forms a physical barrier which separates the two sides of the river, limiting potential biodiversity connections between the adjacent wetland habitats.

9. Maitland Garden Village Threshold

The Mache Golf Course dominates the threshold between the Black River and Maitland Garden Village interrupting possible connections between the two. In addition the residences back-ing onto the Green Corridor are oriented away from the river system. The character of the landscape is dominated by grass slopes and remnant wetlands bordering the Black River.

10. Alexandra Hospital Threshold

Situated on a raised promontory above the Black River, the landscape threshold bordering the Alexandra hospital is characterised as a grass verge abutting the M5, with panoramic views across the Raapenberg wetlands. The proximity of the M5 is both divisive and visually intrusive which precludes a positive connection between the hospital and the Black River. Reinforcing this landscape as a remnant fragment.

11. Berkley Road Threshold

The patchy seasonal wetlands and grass meadows characterise the landscape situated between the Berkley Road T junction and the confluence of the Black and Liesbeek Rivers. The low lying valley bottom topography enables access to the river's edge, a river- landscape relationship which differs from that experienced at Oude Molen which is a pastoral to natural wetland edge relationship, to Maitland Garden village which is a steep grass slope to rivers edge relationship and Alexandra Hospital which is one of a raised grass verge with views over the river and no possible contact with the water's edge due to the M5.

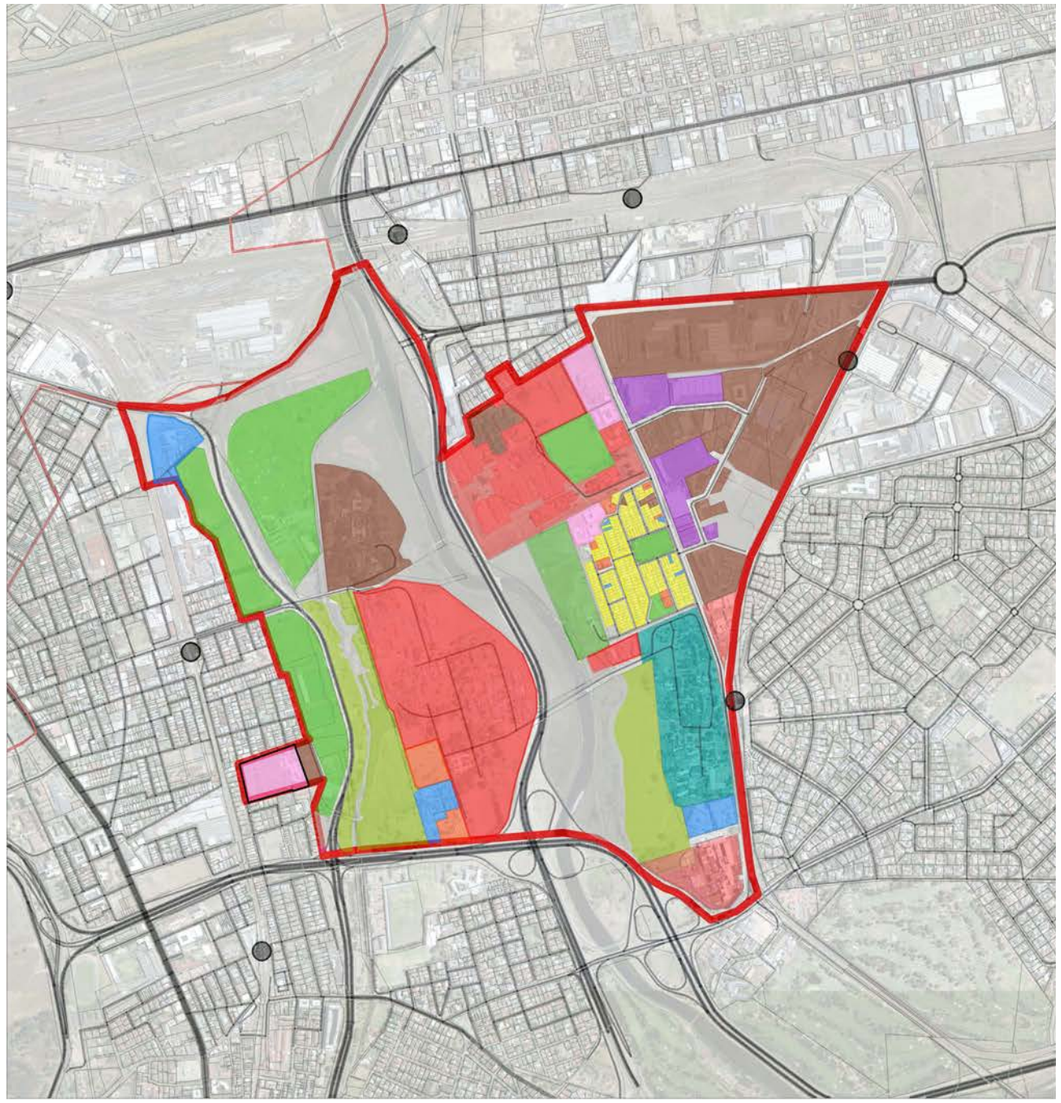
notes .....

notes .....

notes .....

notes .....

8. Urban Systems Analyses



River Corridor Management Plan

scale 1:20 000 at A4

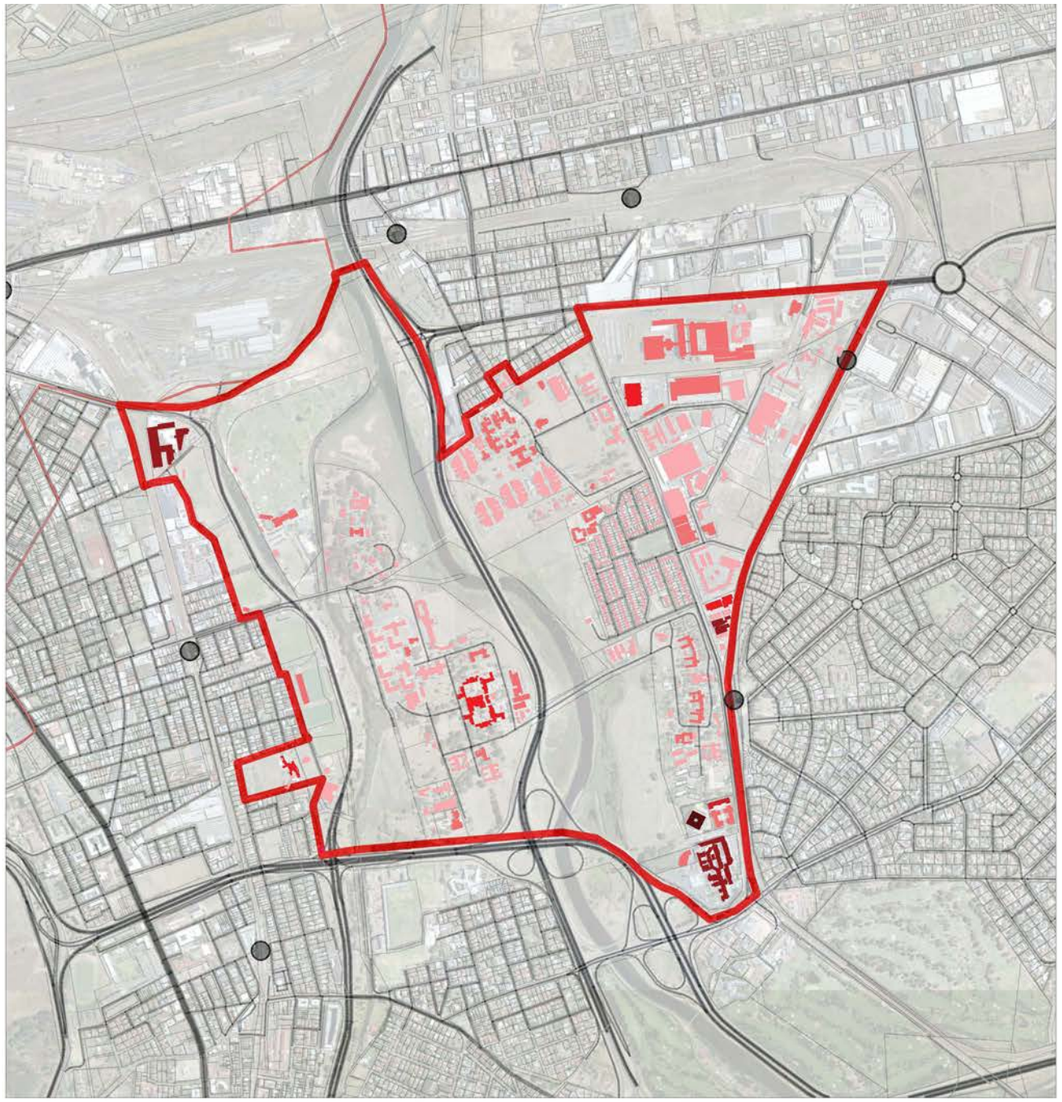
LAND USE

Compiled by: NM & Associates

0 100 250 500

KEY

- TRUP Boundary
- Residential
- Community Facility
- Schools
- Commercial
- Industrial
- Passive Recreation
- Formal Recreational Space
- Utility/ Government Service
- Healthcare/ Medical Research
- Vacant



River Corridor Management Plan

scale 1:20 000 at A4

BUILDING HEIGHT ANALYSIS

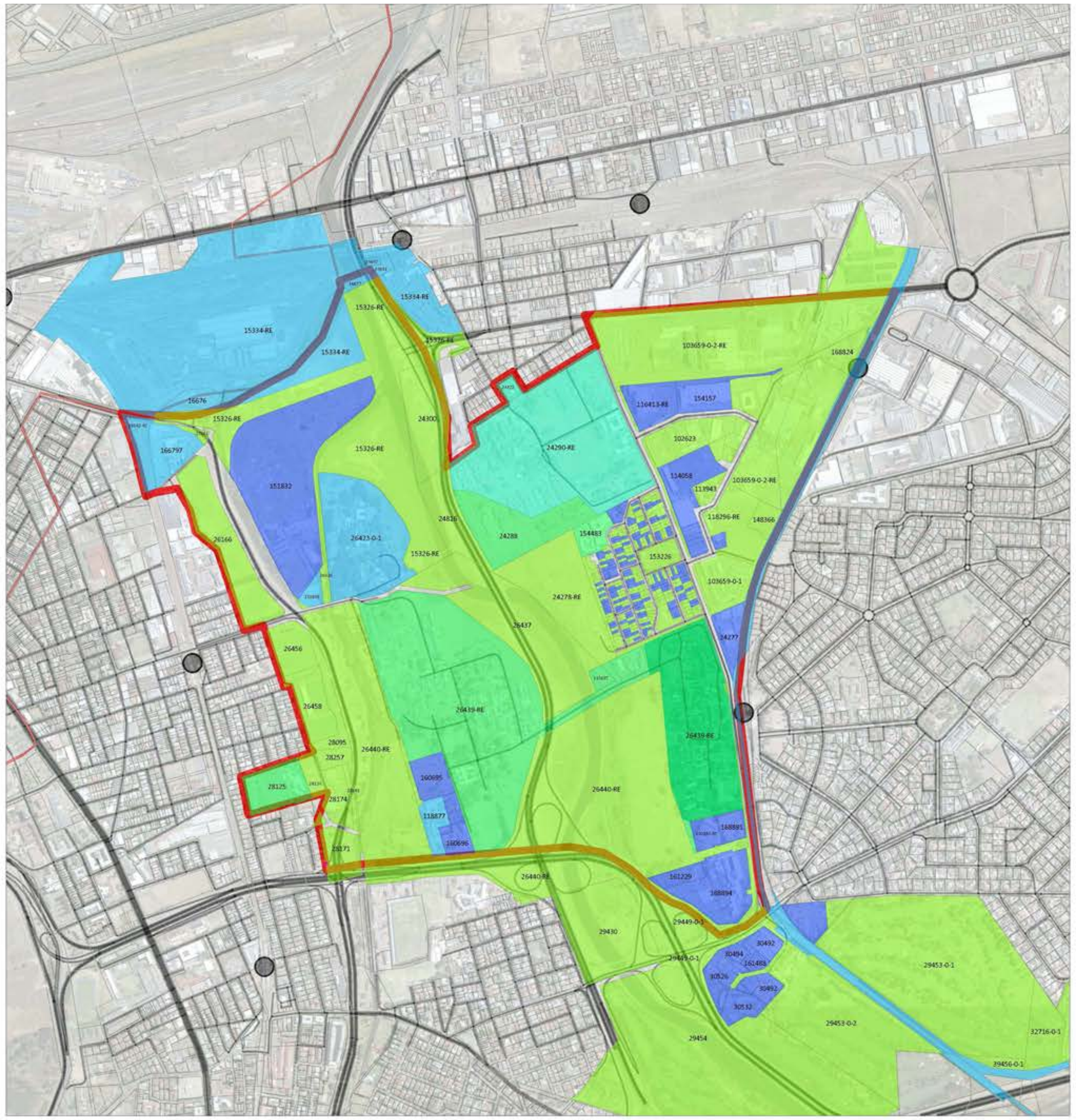
Compiled by: NM & Associates

0 100 250 500

KEY

- TRUP Boundary
- 1 Storey Building
- 2 Storey Building
- 3 Storey Building
- 4 Storey Building
- 5 Storey Building
- Structures in disrepair

NOTE: Height reflects floors of accommodation and not total height



River Corridor Management Plan

OWNERSHIP

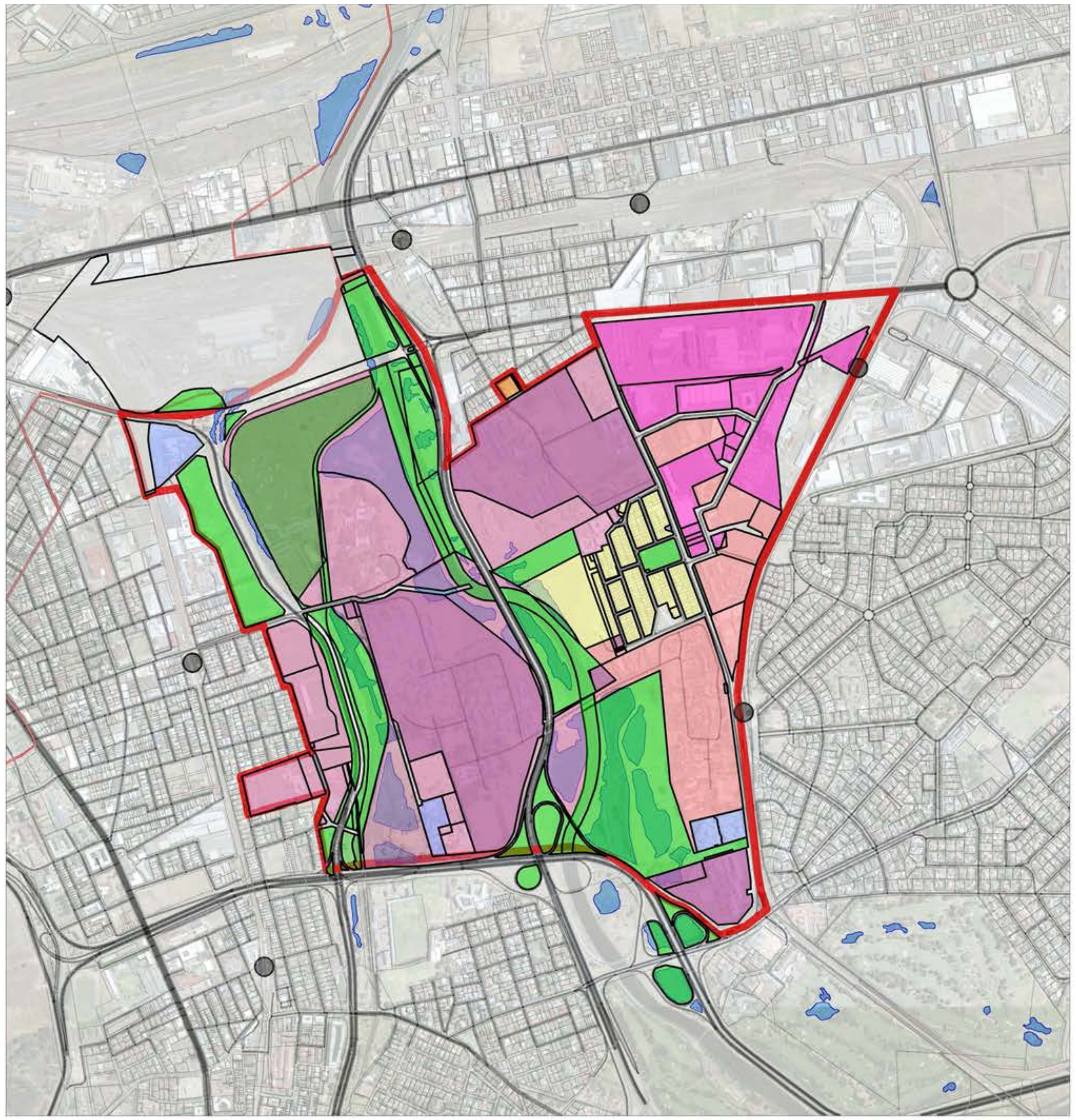
scale 1:20 000 at A4

0 100 250 500

Compiled by: NM & Associates

KEY

- TRUP Boundary
- Private
- Parastatal
- National
- Provincial
- CoCT



River Corridor Management Plan

ZONING

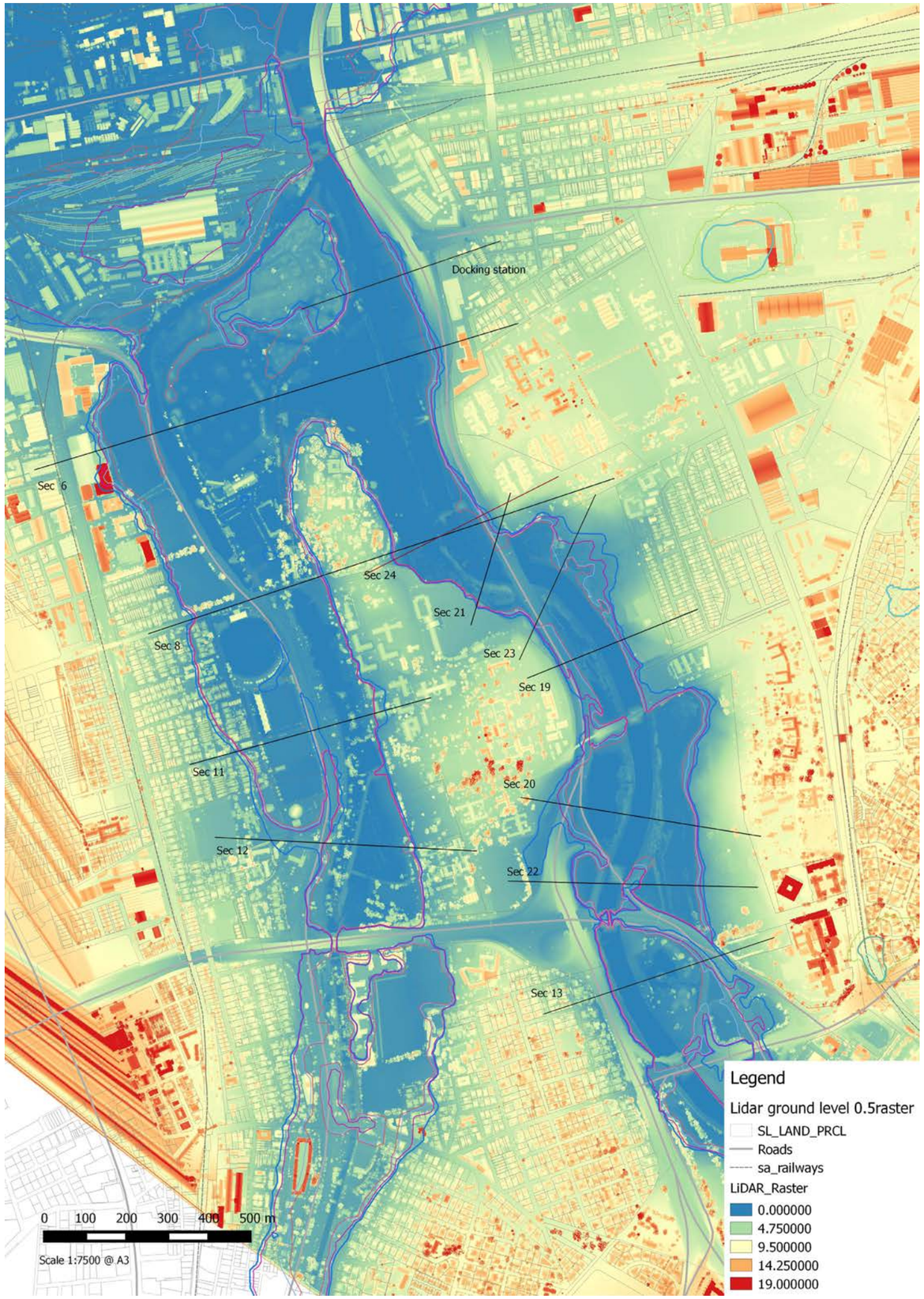
scale 1:20 000 at A4

0 100 250 500

Compiled by: NM & Associates

KEY

- TRUP Boundary
- Community 1: Local
- Community 2: Regional
- General Business 1
- General Industrial 2
- Single Residential 1
- General Residential 4
- Mixed Use 2
- Open Space 2
- Open Space 3
- Transport 1
- Utility


Docking station
Sec 6
Sec 24
Sec 21
Sec 8
Sec 23
Sec 19
Sec 11
Sec 20
Sec 12
Sec 22
Sec 13
Legend
Lidar ground level 0.5raster
SL_LAND_PRCL
Roads
sa_railways
LiDAR_Raster
0.000000
4.750000
9.500000
14.250000
19.000000
0 100 200 300 400 500 m
Scale 1:7500 @ A3

notes

River Corridor Management Plan

SERVICES ELETRICITY

Compiled by TKLA

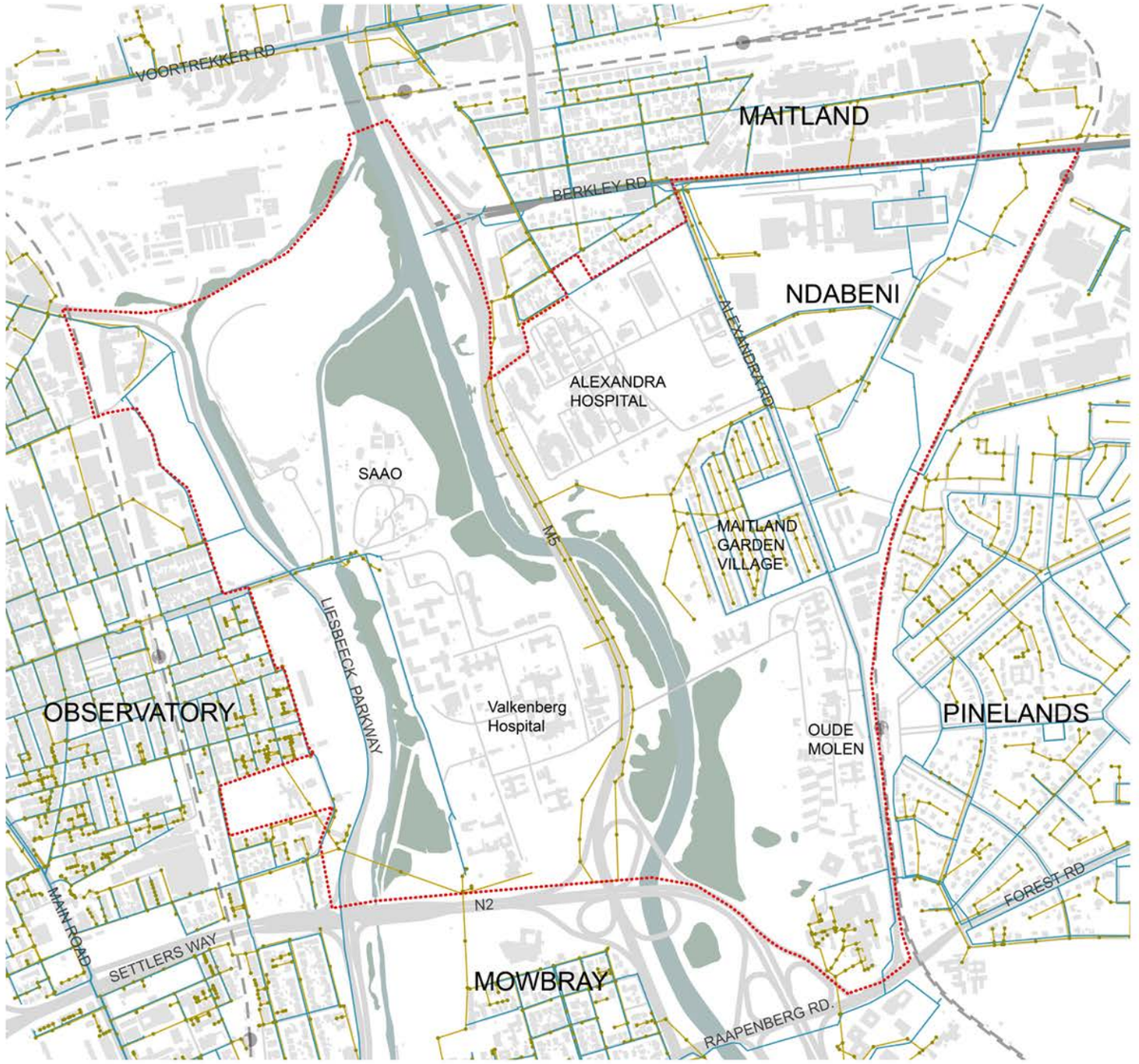
KEY

scale 1:5 000 at 60 x 80 cm

0 100 250 500

- TRUP Boundary
- High Volt Eletrical Cable
- Medium Volt Eletrical Cable
- Low Volt Eletrical Cable
- High Volt Eletrical Cable Buffer

Sources: RHDHV 2016



River Corridor Management Plan

SERVICES WATER

Compiled by TKLA

KEY

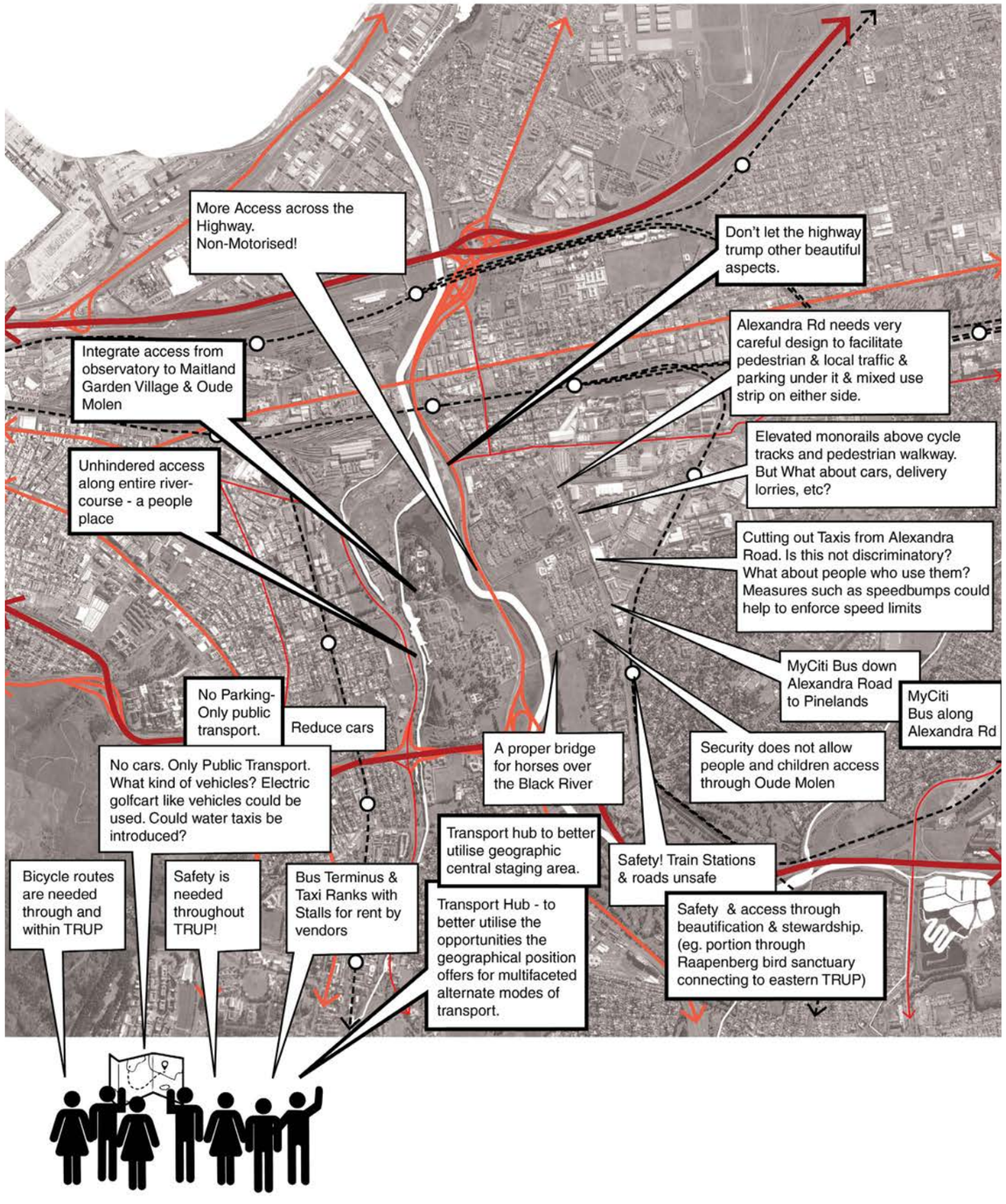
scale 1:5 000 at 60 x 80 cm

0 100 250 500

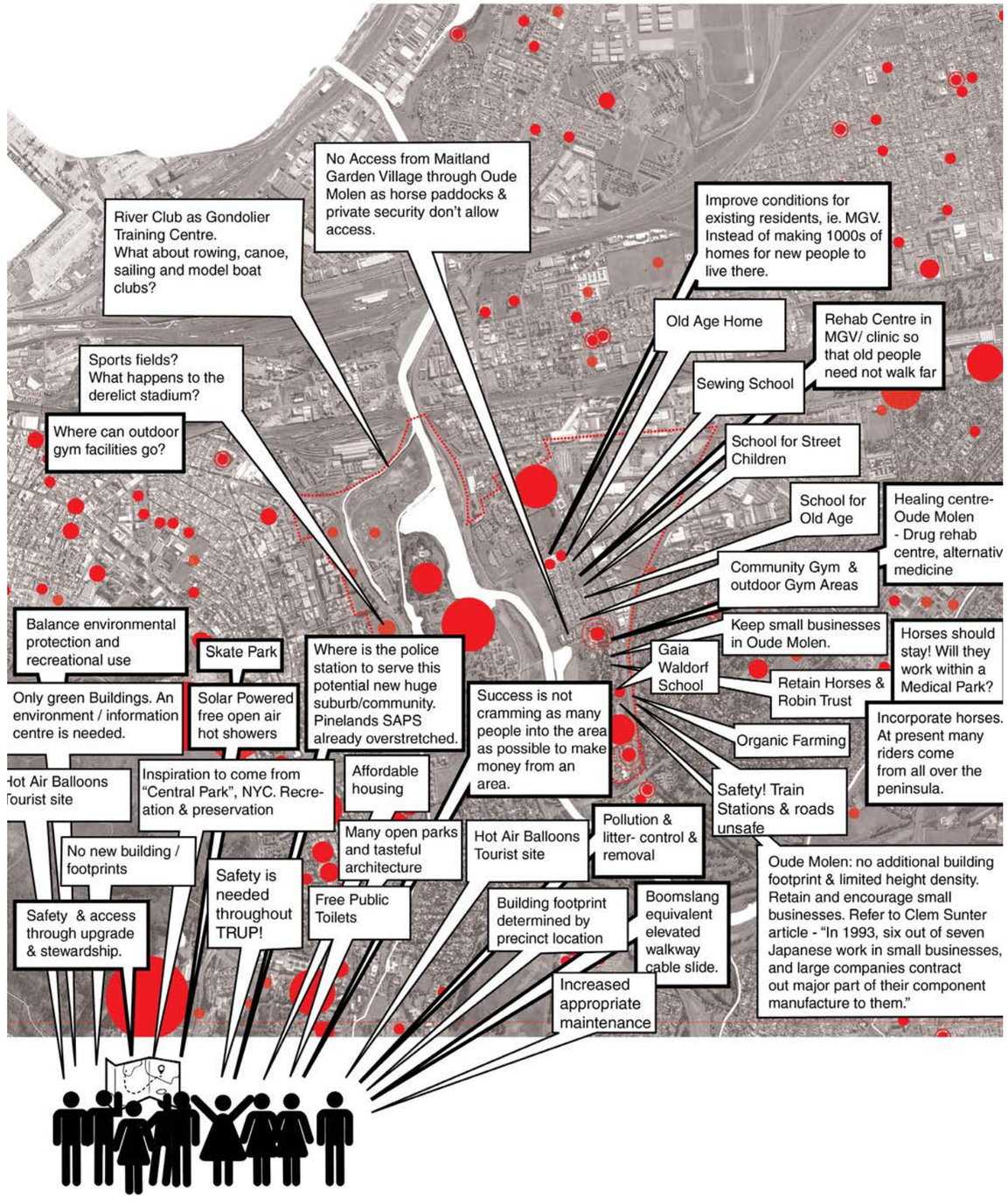
- TRUP Boundary
- Water Pressurized Main
- Sewer Gravity Main
- Manhole

Sources: RHDHV 2016

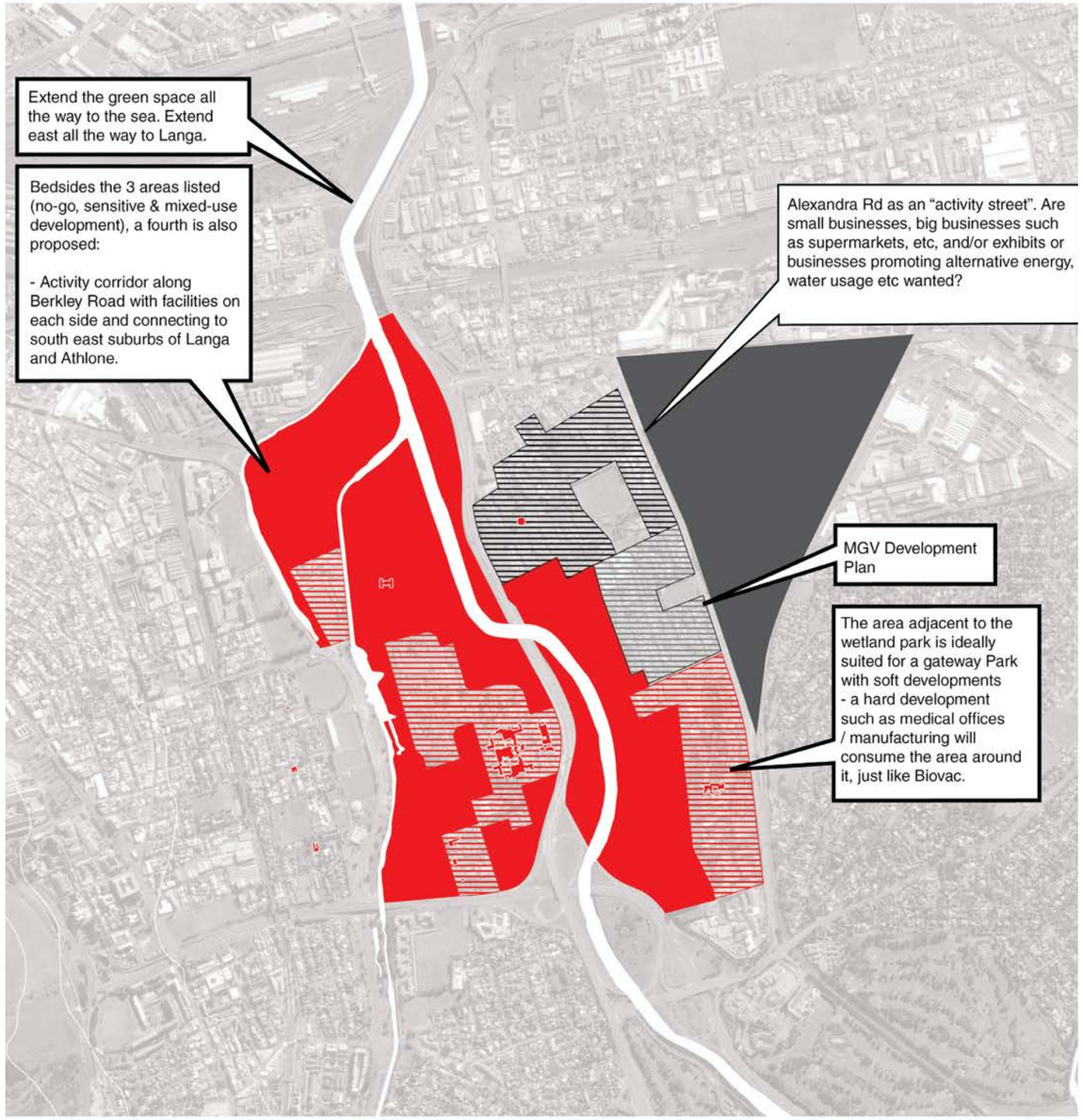
9. Mobility, social infrastructure and future development ideas



WHAT ABOUT THE MOVEMENT SYSTEM...?



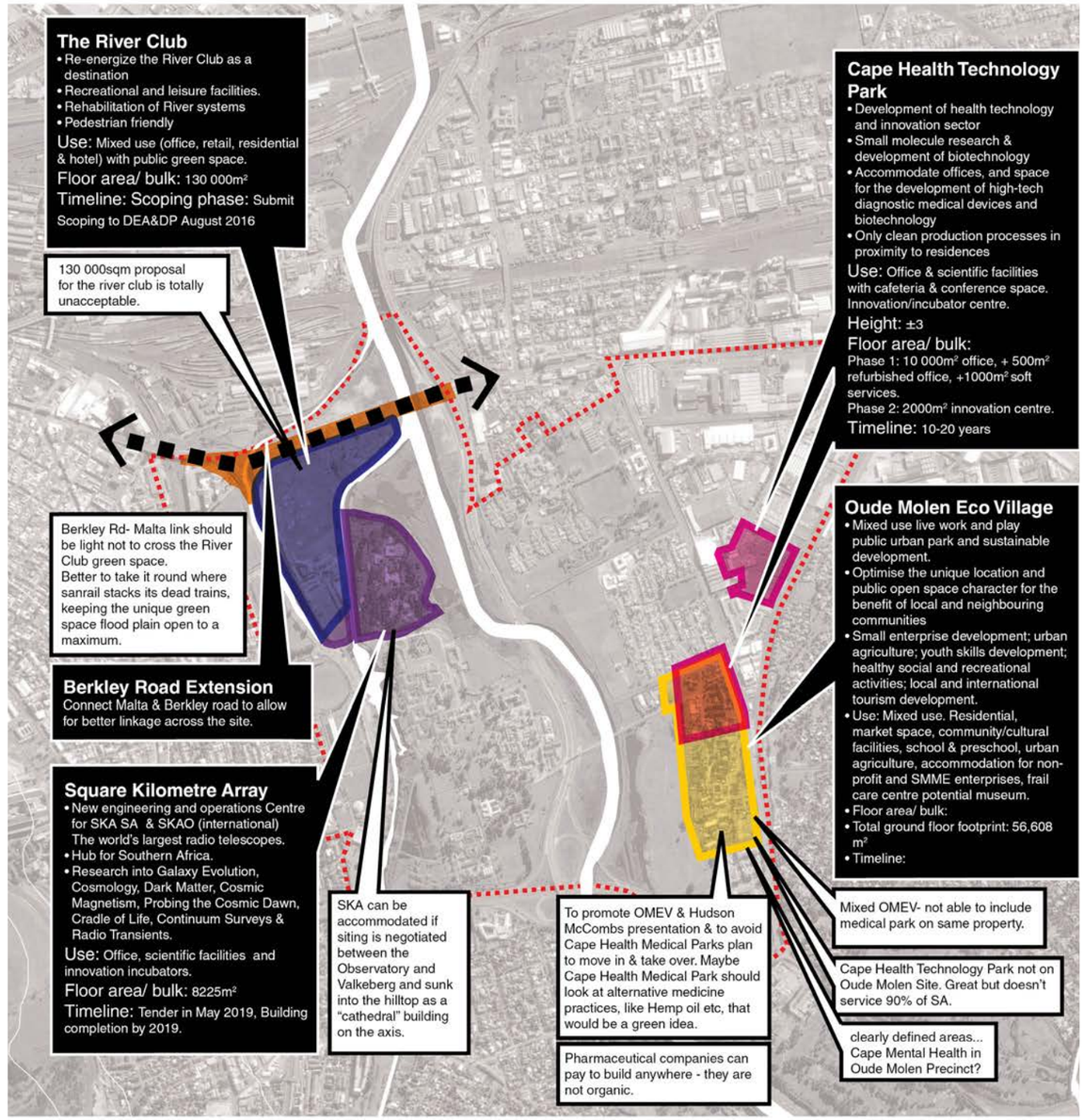
WHAT ABOUT THE SOCIAL FACILITIES...?



DEVELOPMENT AREAS...?

Development Areas - Workshop 3

- **No-go area**
  natural, green space area
- **Sensitive area**
  Oude Molen
- **Sensitive zone [requires consultation]**
  Maitland Garden village
- **Graded sensitive area**
  Alexandra hospital area
- **Developable areas**
  Ndabeni area



DEVELOPMENT PROPOSALS

Development Proposals/ Vision - Workshop 4 & 5

- **Cape Health Technology Park**
- **Oude Molen Eco Village**
- **Square Kilometer Array**
- **The River Club**
- **Future Berkley Road Connection**

10. Urban dis/continuities

what do you think?.....

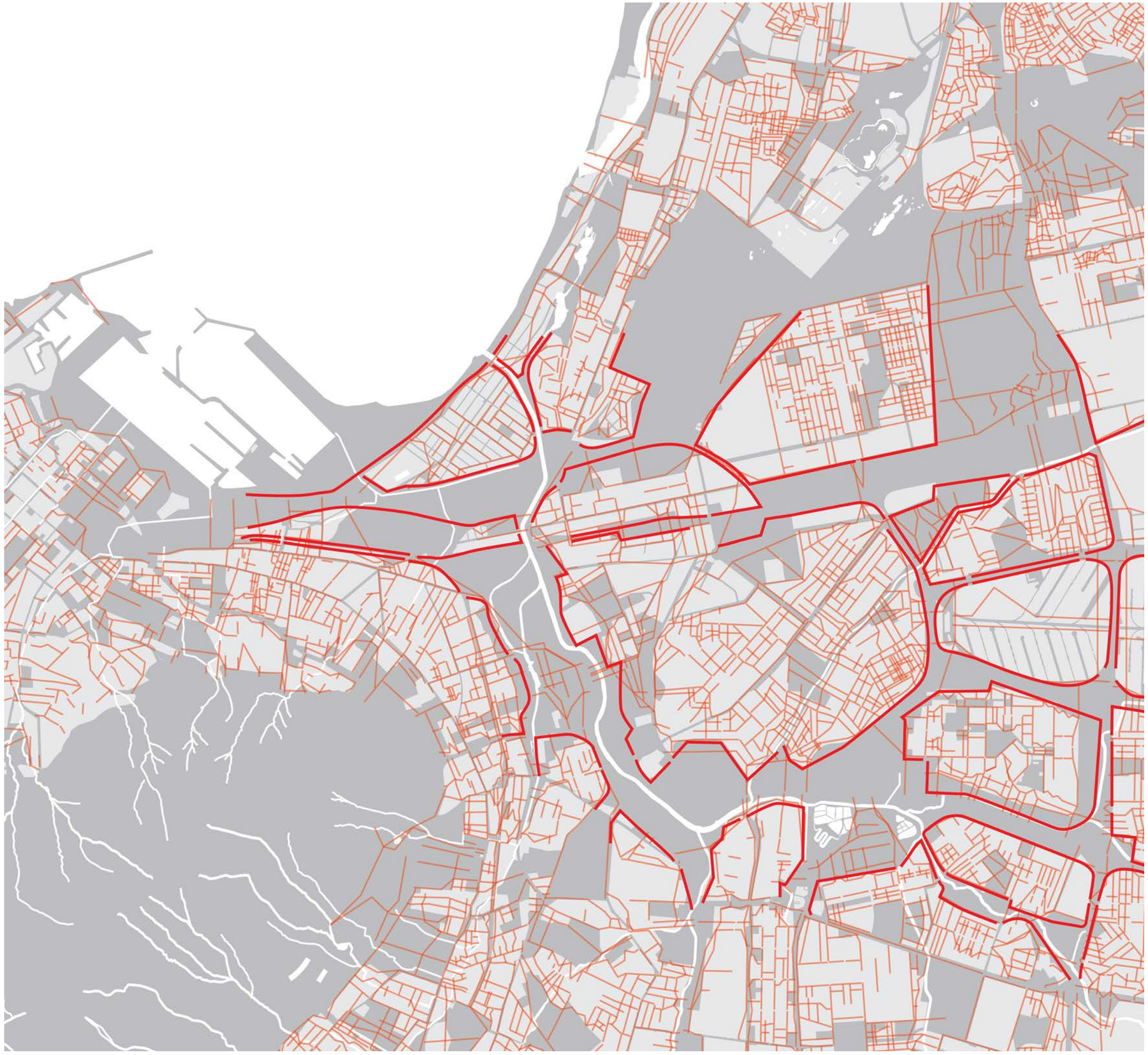
barriers
1:20 000 @A1
[12 x 12km]

- Blockages / Urban Stones
- Riverine systems
- Highways
- Railway

what do you think?.....

invisible walls
1:20 000 @A1
[12 x 12km]

Urban Fabric
Large Invisible walls
Invisible walls



what do you think?.....

enclaves
1:20 000 @A1
[12 x 12km]

Urban Fabric
Enclosed enclaves & entry points

part 3_ specialist studies findings

10.1. Specialist studies reports and status

Report title	Version	Status
Specialist Botanic and Ecological Scoping Phase Input	Final	Released
Specialist Report: Aquatic and Water Quality Assessment	Final	Released
Heritage Baseline Study	Draft	Released
Specialist Study: A Property Market Potential Analysis and Supplementary Report	Final	Released
Specialist Study: Watercourse Management and Creating a docking/waterfront feature	Final Draft	Not Yet Released
Specialist Study: Modelling of Flood Mitigation Options on the Salt River: Task 1 [Set up modell]	Final	Not Yet Released
Specialist Study: Modelling of Flood Mitigation Option on Salt River: Task 2	Draft	Not Yet Released
Specialist Study - Enginnering Service Model: Transportation Systems	Draft	Pending Release
Specialist Study - Enginnering Service Model: Water and Sanitation Infrastructure	Draft	Pending Release
Specialist Study - Enginnering Service Model: Electrical Service	Draft	Pending Release

The following pages comprise of the main findings of the specialist studies as presented to the stakeholders during the Public Participation Process. Individual specialist studies may contain further recommendations and findings. Please refer to final studies as these will be released.

10.2. Specialist Botanical and Ecological Input

The main **findings** of the Specialist Botanic and Ecological Input conducted by Nick Helme are the following:

- Vegetation and ecology heavily disturbed, and no significant patches of intact natural vegetation remain within the non-wetland areas.
- Botanical diversity is generally very low
- Faunal diversity is significantly lower than in the past, although avifaunal diversity is still relatively high
- Areas of Botanical and Faunal sensitivity were identified and graded (medium and high)

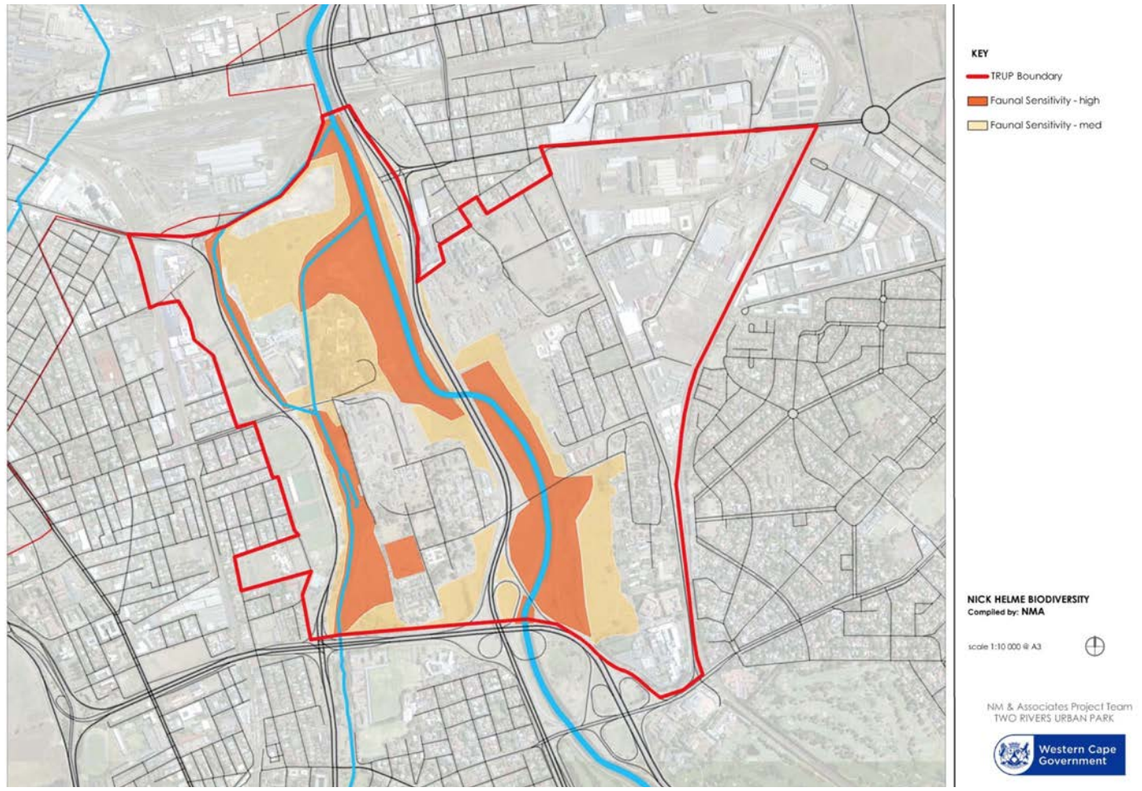
The main **recommendations** emerging from the specialist study are the following:

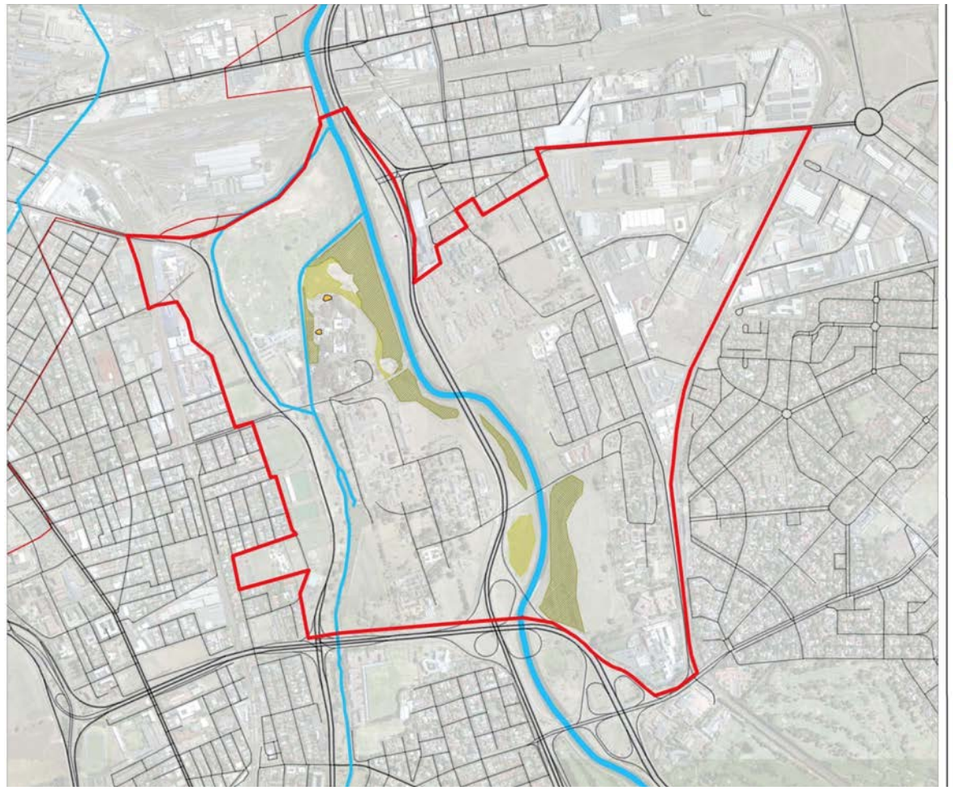
- All areas mapped in the City's Biodiversity Network as 'Protected in Perpetuity' should be excluded from hard (infrastructural) development plans but should ideally be rehabilitated (including alien removal, reintroduction of suitable locally indigenous plants, etc. (Note: According to CCT:ERM - compatible low impact recreation and environmental education per an EMP can be considered but no hard infrastructure within the CBA's is permitted)
- No hard development should be undertaken in areas of High Faunal or Botanical Sensitivity (possible exception of lighter structures in areas of High Faunal Sensitivity)
- Limited development could be considered in the Medium Sensitivity Areas, provided that it does not compromise ecological connectivity. (Less than 5% of the particular area)

More recommendations:

- Create a 10m fringe of natural vegetation either side of the canal / river channel
- Consider some of Valkenberg as an ecological link between Liesbeek and Black River
- Improve ecological connectivity and 'animal friendliness' across the site by means of vegetation rehabilitation to maximise habitats and plant species
- De-canalise canals downstream with multi-tiered banks
- Where soil is very contaminated - consider developing the land
- Create a number of vegetated breeding ponds away from the river for Leopard Toads
- Consider design of fences carefully and provide rounded kerbs in roads
- Phragmites and Typha need to be cleared but mechanical methods of reed and bulrush removal are not appropriate
- Litter removal is essential
- Provide additional roosting, resting and hunting sites along rivers for birds
- Don't use herbicides along banks of the rivers
- Avoid mowing of rehabilitated areas

Note: Significant budget will be required to attend to theses recommendations on ongoing basis. Funds need to be secured asap.





KEY
- TRUP Boundary
- Veg Sensitivity - high
- Veg Sensitivity - med
- Moraea Aristata

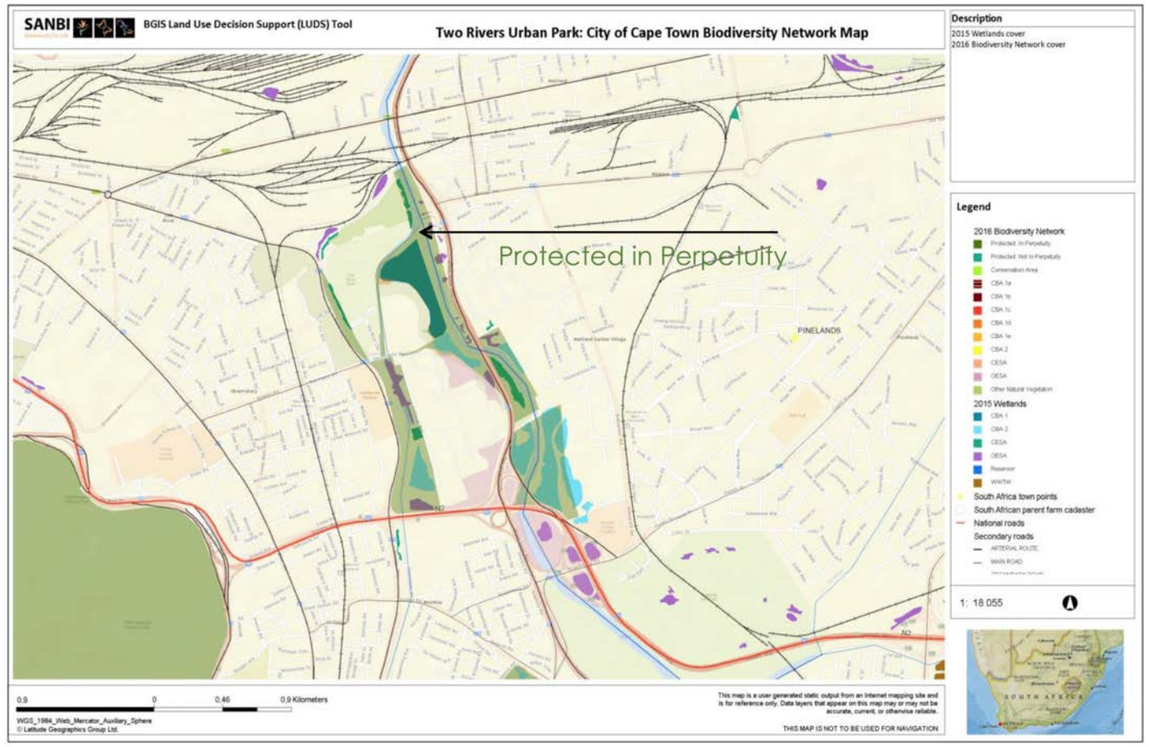
NICK HELME BIODIVERSITY
Compiled by: NMA

scale 1:10 000 @ A3

NM & Associates Project Team
TWO RIVERS URBAN PARK

Western Cape Government

Biodiversity Agreement
CoCT/CapeNature



notes .....

10.3. Aquatic and Water Quality Assessment

The main **findings** of the Aquatic and Water Quality Assessment conducted by Toni Belcher and Dana Grobler are the following:

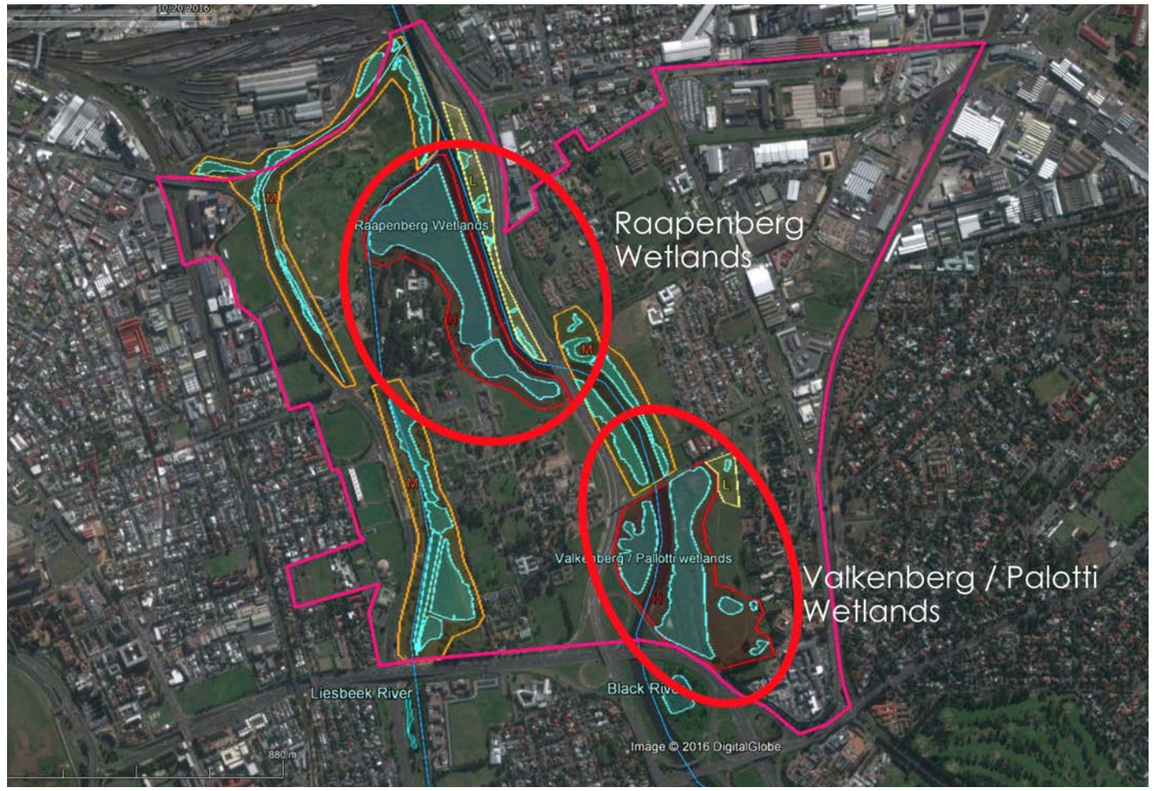
- The Raapenberg, Vincent Pallotti and Valkenberg wetlands are considered to be the most important wetland areas with high degrees of sensitivity
- The **ecological condition** of these aquatic ecosystems:
  - Wetland areas: moderately to largely modified
  - Rivers: largely to seriously modified
- **Ecological importance and sensitivity** of these aquatic ecosystems is deemed to be moderate to high in general with only the Black River being low to moderate
- The water quality in the river systems is highly variable and linked to seasonal variabilities
- Water in the Black River is significantly more degraded than in the Liesbeek River but there is an upward trend in water quality generally over 20 years.
- Proposed development is likely to have an impact of low significance on the aquatic eco-systems with potential for a positive impact if the recommendations are listened to.

The main **recommendations** emerging from the specialist study are the following:

- Impact of stormwater runoff into aquatic features should be mitigated
- Invasive alien vegetation within aquatic ecosystems and buffers should be removed
- A buffer of 35m should be maintained around the aquatic features
- Minimal development should take place within the more sensitive wetland areas and the buffers
- Rehabilitation of the lower Liesbeek River , to reinstate corridor for aquatic biota, according to an approved rehabilitation plan. Two options are provided:

[1] Reinstate old flows into Liesbeek River, install silt traps and reshape and re-vegetate channel but keep concrete canal

[2] Replace original Liesbeek River channel with smaller wetland areas and rehabilitate concrete canal by removing concrete and re-vegetating banks



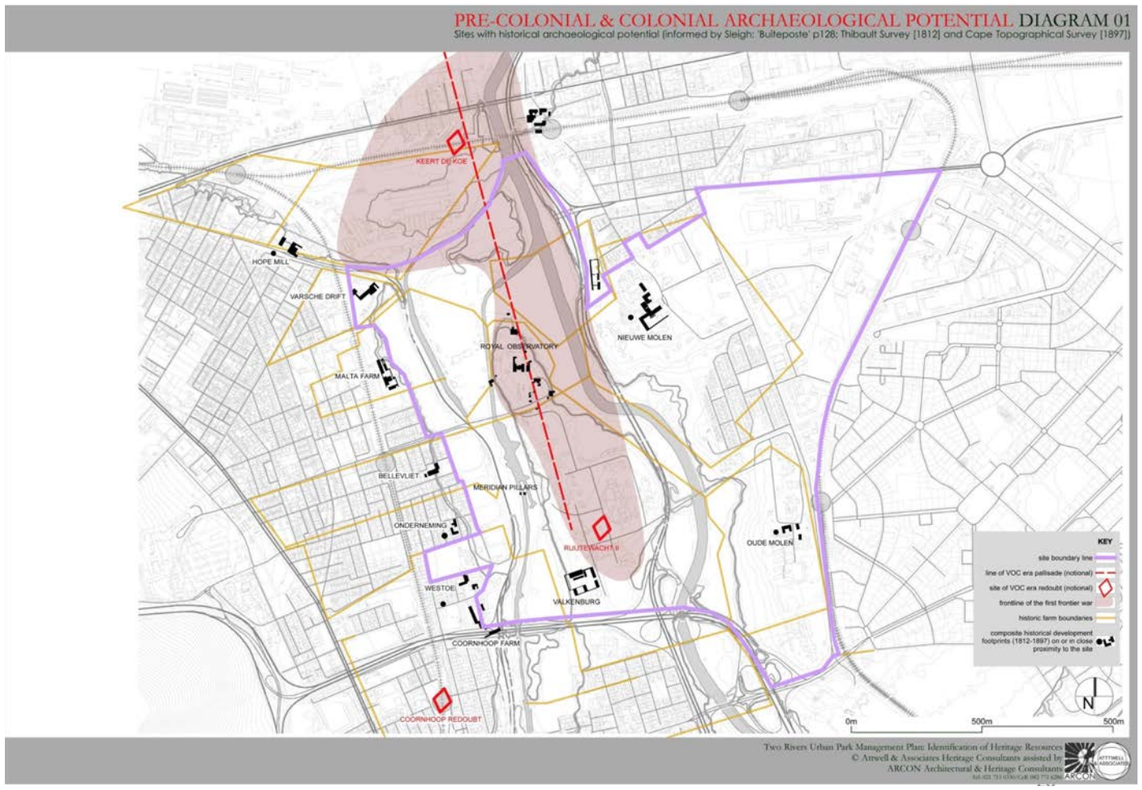
10.4. Draft Heritage Baseline Study

The heritage Baseline Study conducted by Melanie Attwell identifies and assesses heritage resources and provides statements of significance followed by heritage related design informants. It was preceded by An assessment of the pre-colonial and proto-historical significance of the Two Rivers Urban Park site, ACO Associates, 2015. The specialist study findings are the following:

- The heritage sites and sites of memory exist at a variety of scales from objects of significance to entire landscapes of intangible value.
- The site is important in the pre-colonial and early colonial history of the Cape and has high heritage significance.
- A series of Site Heritage indicators (HRDI) have been identified per character area. The **Eight Character Areas** identified are the following:
  - The TRUP site and the Green River Corridor System
  - Ndabeni,
  - The Alexandra Institute and Surrounds,
  - Maitland Garden Village,
  - Valkenburg East,
  - Valkenburg West,
  - The South African Astronomical Observatory (SAAO),
  - The River Club and Vaarschedrift,
  - The Liesbeeck River Parkway Corridor

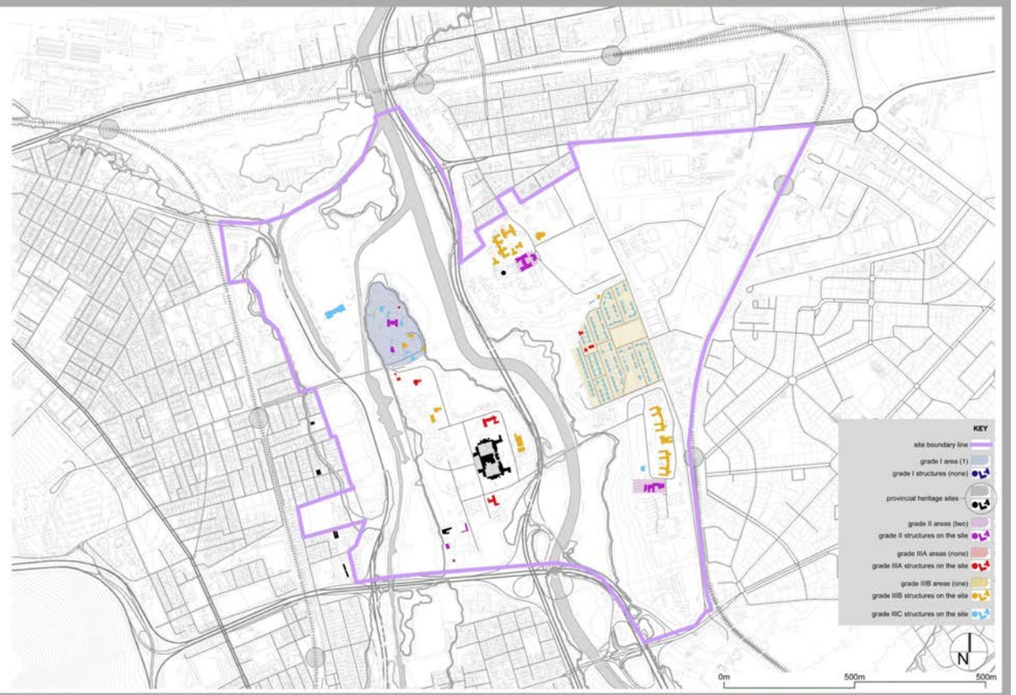
The main **recommendations** emerging from the study are the following:

- That the Baseline HIA be endorsed by HWC as meeting the requirements contained in the Response to the NID, dated 25th August 2016.
- That the endorsement (comment) be made in terms of S 38(8) of the NHRA.
- That the statements of cultural significance (Section 10) and the HRDI be considered sufficient to guide the planning process and be endorsed accordingly.
- That the gradings proposed in the study be examined in the study and endorsed accordingly
- That this Baseline Report be submitted to SAHRA for comment because of the recent status of the Observatory Hill as a grade 1 site.
- That further HIA's undertaken in relation to the priority release areas are submitted to HWC for comment.
- That future precinct-based HIA's be submitted to HWC for comment in terms of S38(8), NHRA.



PROVINCIAL HERITAGE SITES AND GRADED RESOURCES DIAGRAM 02

Heritage resources on the site graded in terms of Sections 3 and 7 of the National Heritage Resources Act, and grade II resources within the immediate proximity of the site



Two Rivers Urban Park Management Plan: Identification of Heritage Resources
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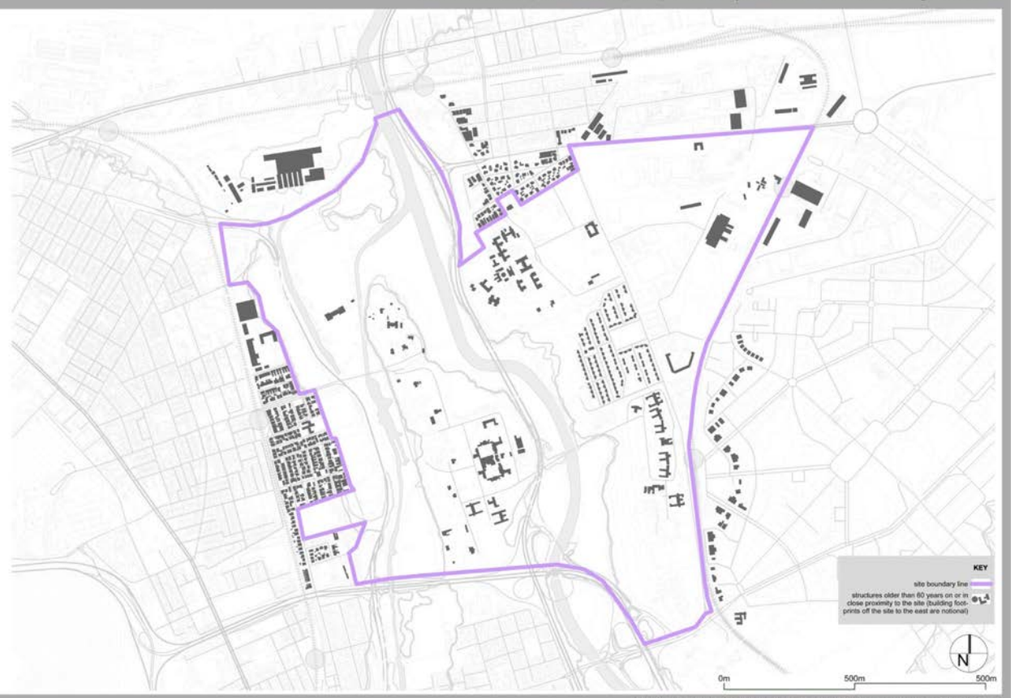
STRUCTURES OLDER THAN 60 YEARS DIAGRAM 03

Structures older than 60 years on, or in close porximity to the site. Subject to Section 34 of the National Heritage Resources Act



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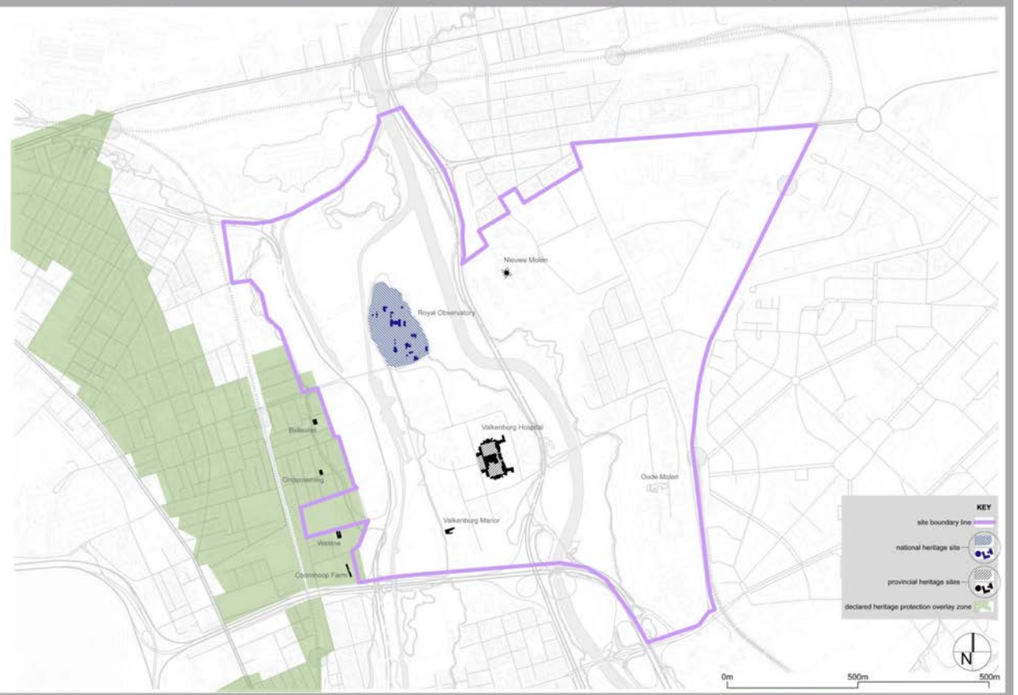
FORMAL PROTECTIONS DIAGRAM 04

Formally Protected Areas: National & Provincial Heritage Sites (ito the National Heritage Resources Act) and Heritage Protection Overlay Zones (ito the City of Cape Town Zoning Scheme)



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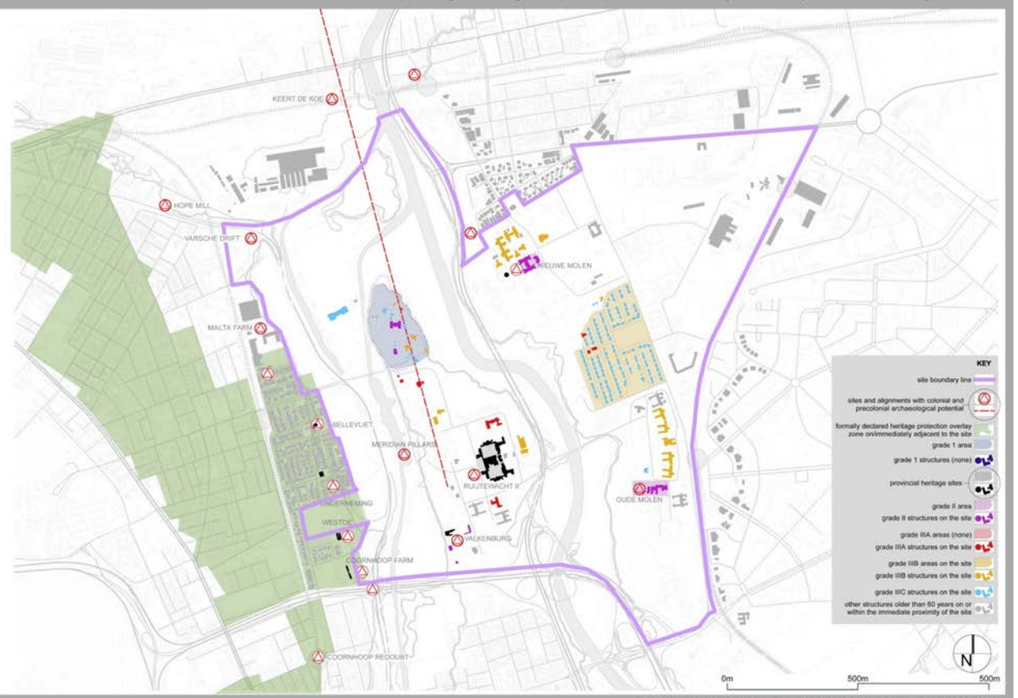
COMPOSITE DIAGRAM 05

Composite diagram of heritage areas, potentially sensitive sites and heritage resources subject to the National Heritage Resources Act



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POTENTIAL COMMEMORATIVE SITES & CULTURAL CENTRES DIAGRAM 06

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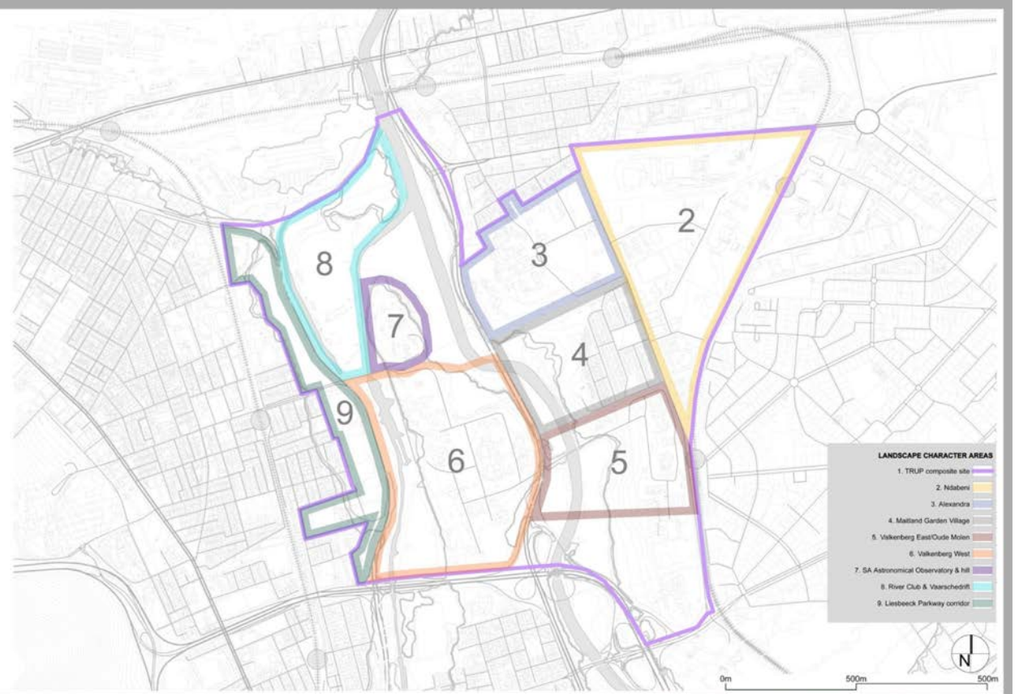
LANDSCAPE CHARACTER AREAS DIAGRAM 07A



Two Rivers Urban Park Management Plan: Identification of Heritage Resources
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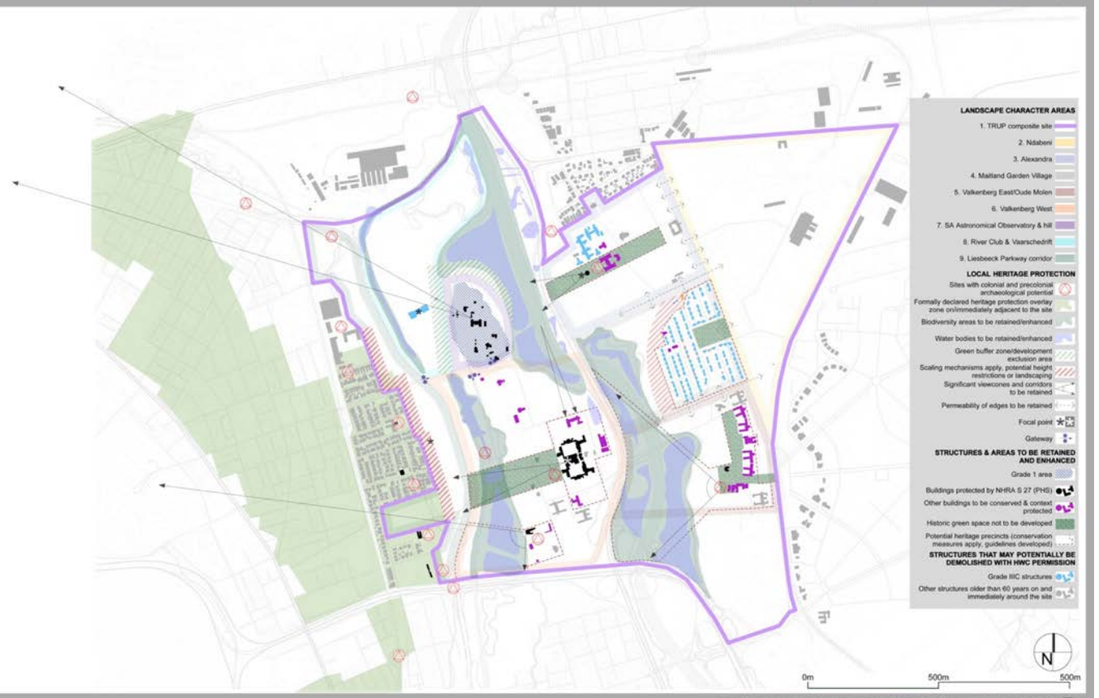
HERITAGE RELATED DESIGN INFORMANTS DIAGRAM 07

High level heritage-related informants for future development



Two Rivers Urban Park Management Plan: Identification of Heritage Resources
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notes .....

Progress and Way Forward:

Registered conservation bodies and stakeholders have sent their comments.To date the focus of the comments have been on the following amongst others:

- River Club - concern around development of floodplain and open space and development in the vicinity of the SAAO
- Development of "TRUP" as defined by the previous Contextual Framework of, 2003. Call for no development in "TRUP". Need for preservation of open space
- Fast-tracking of developments by WCG / CoCT within the site a concern

The Draft Heritage Baseline report will be revised according to the comments received, before submission to HWC later in February 2017.

10.5. Market Potential Study

The main **findings** of the Market Potential Study by Francois Viruly Consulting are the following:

- The site is well located from a transportation / access perspective
- The site has a role to play in strengthening the local economy, in particular in
- The medical and educational clusters (CHTP have a potential role to play here)
- The site has the potential to enhance the home, work, play and education environment (SKA and relationship to local academic institutions have reference here)

The analysis of the property market revealed the following:

- The site could capture a take-up of office space of some 2,800m^2 per annum.
- The residential research suggests that TRUP could secure a take-up of 161 units per annum.
- A neighborhood shopping centre of 10,000m2 could become viable once
- The number of households living and working on the site is sufficient

BUT

- Socio-political imperative of addressing the housing deficit, i.e housing people close to opportunities, will aid the urban transformation agenda on centrally located land such as TRUP and challenges the findings.

Further findings are the following:

- Development is expected to take place over a 20-30-year period as take-up figures suggest
- The take-up rates of large mixed-use developments should be based on a clear understanding of competing developments eg. Conradie Hospital site, the Athlone Power Station site, the Voortrekker corridor etc.

Interviews with developers have indicated the following:

- Merit in the focus on the residential property market
- Development should focus on the social housing market and non-subsidised market
- The role of government is to develop a vision and Concept only, ensure development rights are in place
- The provision of infrastructure
- Enable release of land in appropriate manner
- Public sector will need to create a development entity
- Consider a number of developers across TRUP rather than 1
- Use government leases to act as anchors
- Initiate kick-start projects
- Issue of urban management is given attention
- "Green Technology" is an expense upfront but even for affordable housing makes sense as energy and water costs increase
- Innovative untested solutions will be requires to ensure the success of a mixed use /mixed tenure development with a focus on affordable housing.

Residential property market income segmentation

Housing type	Monthly income	Value of house
RDP Housing	< R3 500	Subsidy
Social Housing	R3 501 - R7 500	Up to R300 000
Affordable Housing	R7 501 - R15 000	Up to R700 000
Market	> R15 001	> R700 000

Residential property market demand segmentation

Type	Percentage	Unit size [m^2]
Social	20%	40
Affordable	24%	58
Student	6%	70
Market	50%	80
Total	100%	

Fig.8 Residential Segmentation
Note: Segmentation informs the Engineering Services Model.

10.6. Watercourse Management and Creating a Docking /Waterfront Feature

The Watercourse management specialist study conducted by the engineering consultant has a limited scope, focusing on the Black River [not the Liesbeek] within the TRUP boundary.

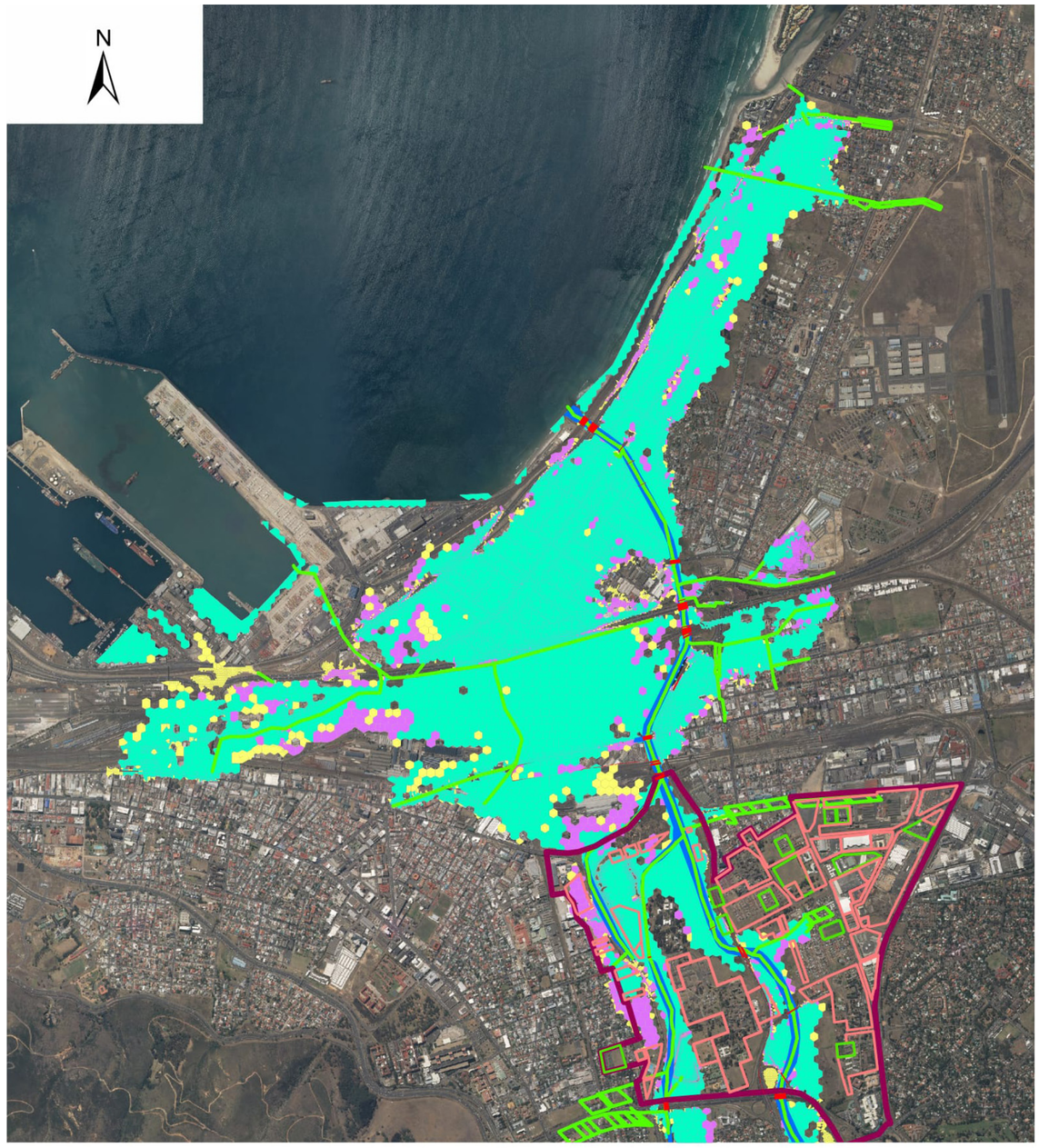
The options studied are the following:

- Separating water from Athlone [pipe, ridge]
- Aeration method and enzyme treatment
- Urban canal restorer
- Meandering
- Litter trap just upstream of TRUP
- Treatment wetlands for Black River Water
- Nature friendly banks
- Maintenance team

The recommendations emerging from the study are the following:

- Investigate treatment of Vygieskraal dry weather flow and effluent of the WWTW of Athlone with enzyme treatment in the maturation ponds, as a pilot;
- Introduce nature friendly banks and develop maintenance plans;
- Consider an 'urban canal restorer' if there will be boardwalks in the wetland in front of Oude Molen;
- Introduce maintenance team rather than a litter trap;
- Do NOT introduce meanders and Waterfront feature at the end of proposed Berkley Road with pavilions; space reservation for docking station for paddlers and recreational rowers, but only to be realised when water quality has improved.

notes .....



Legend

- TRUP site
- Conduits
- Rivers and storm water channels
- Obstructions
- Scenario 7 Developable areas
- Scenario 7 Green Areas
- 1:20 year flood
- 1:50 year flood
- 1:100 year flood

Title: Modelled flood extents for various return periods - with proposed development - Scenario 7 superimposed

Project
T01.CPT.000306 -
Two Rivers Urban Park

Client
nm & associates planners and designers
Western Cape Government: - Transport and Public Works
City of Cape Town

Checked by
Peter Hirschowitz

Number
1 Rev 2

Date
15/02/2017

Scale
1:30000

Royal HaskoningDHV
Enhancing Society Together

nm & associates planners and designers

Western Cape Government
Transport and Public Works

CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

NOTE: MAP AMENDED ON FEBRUARY 15TH, 2017

10.7. Modelling Flood Mitigation Options on the Salt River

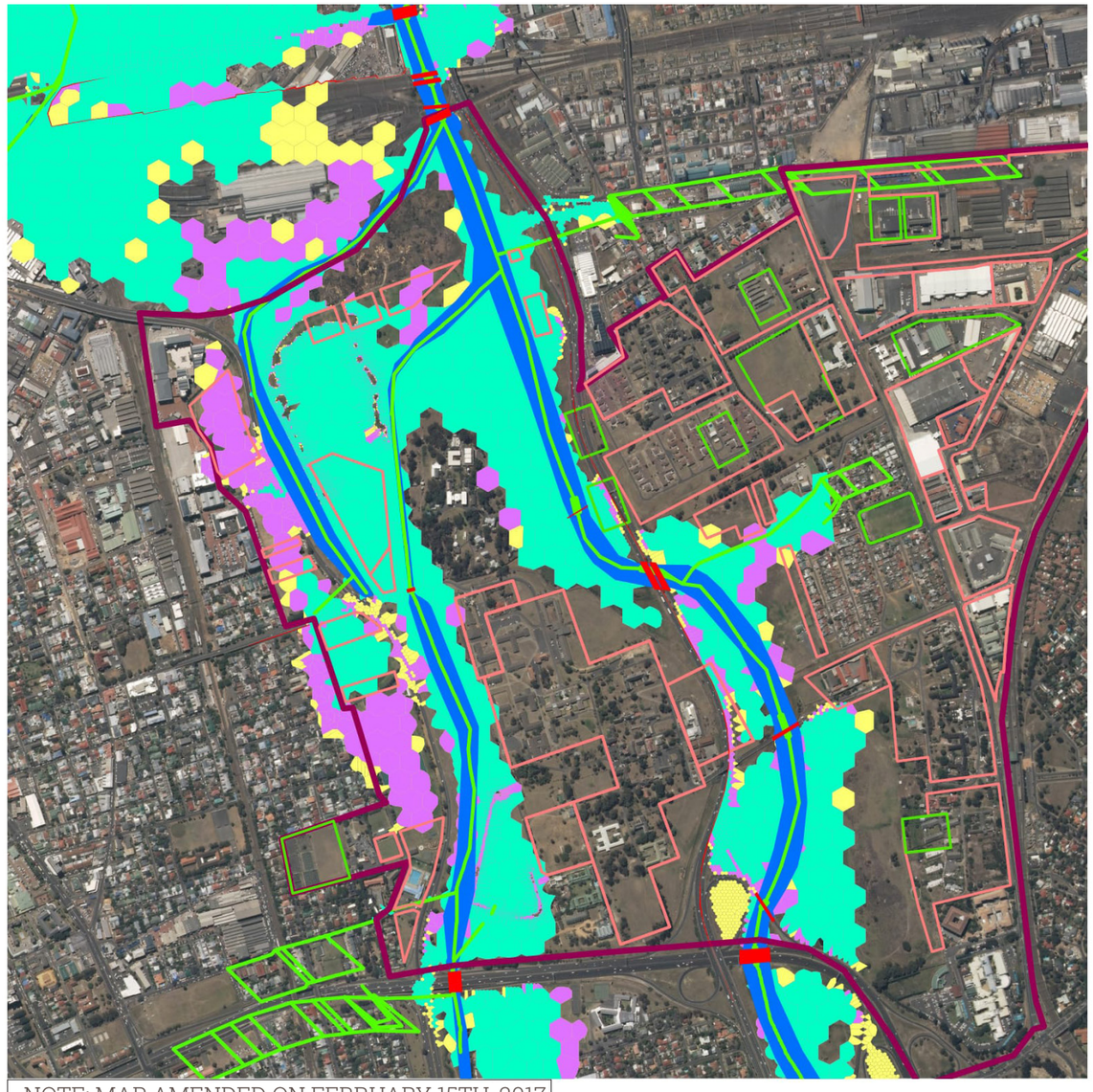
The Flood Modelling study consists of many iterations. Since the Task 2 Draft report [Novemebr 2016] the model has changed, taking into consideration:

- model change, mainly correction of numerical leak at Liesbeek weir
- sensitivity analysis on changes to SRK 2012 model

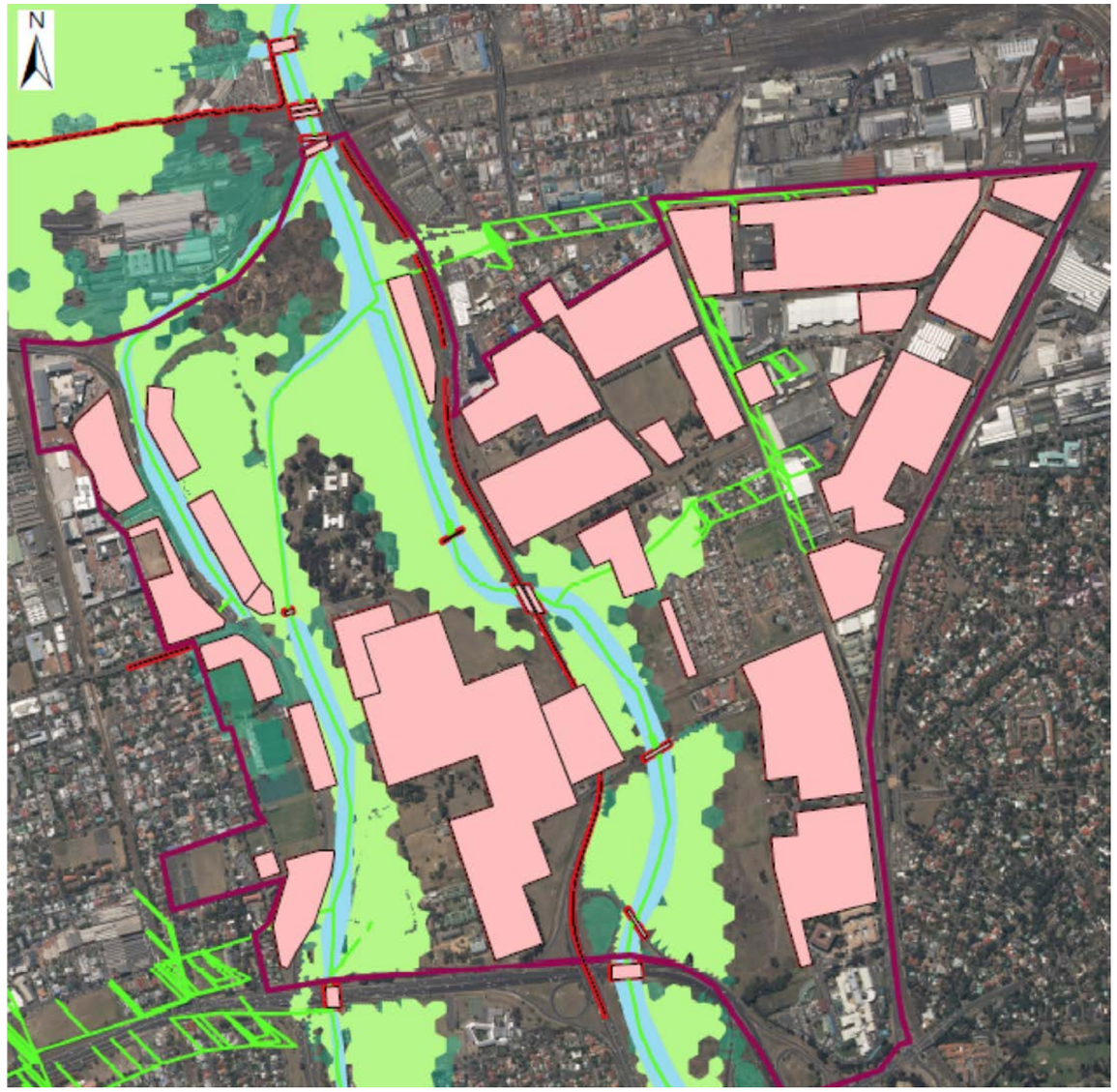
The key findings emerged from urban scenario 7 [the scenario that is baseline for this co-design workshop but is not yet modelled] are the following:

- For the 1:100 year floods the flood line extends into the sport fields on the west of the Liesbeek and in the PRASA area;
- As the floods are larger downstream of the Liesbeek weir than before, the mitigation measures which already did not impact the flood lines of the 1:100 year floods and even the smaller floods, are also not expected to have impact now (after corrections) on the 1:100 year flood lines;
- Flow velocity in floodplains is low but floodplains add storage area and could become flow paths in higher than 1:100 year floods.
- Maximum water depths in some footprints of scenario 7 areas are in the range of 0.8-2 m therefore can be life threatening (18 February 2017)
- The impact of scenario 7 on increase in modelled water levels for the 1:20 and 1:50 flood, is max 5cm (1:100 not modelled)

N.B: This is the latest information as of 10 & 18 February 2017 and any model results after this date will be communicated verbally.



NOTE: MAP AMENDED ON FEBRUARY 15TH, 2017



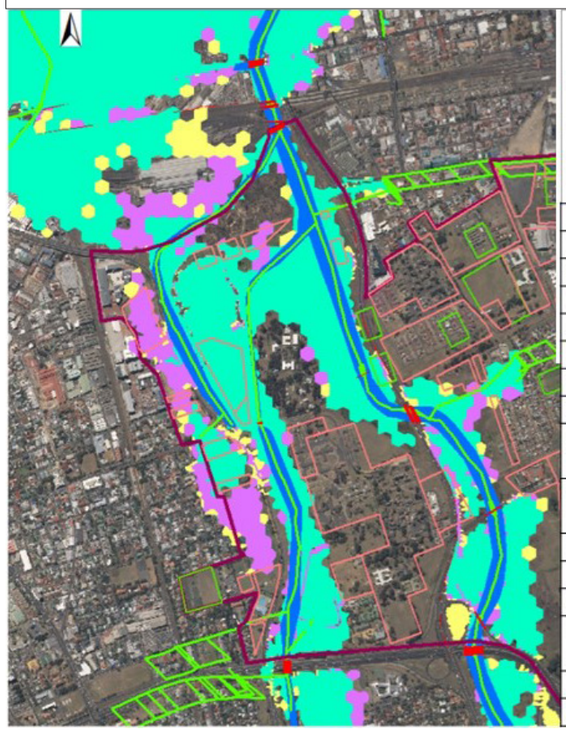
Legend

- Obstructions
- Conduits
- Rivers and stormwater channels
- Flooded with or without corrections
- Flooded only in revised model
- Proposed development

Increase in flood level 1:100 year (m)	
Black River	
Downstream of N2	0.31
Downstream of Valkenburg Bridge	0.37
Downstream of M5 bridge	0.39
Liesbeek River	
Downstream of N2	0.05
Downstream of weir near Wild Fig	0.12
Downstream end of ponds near Wild Fig	0.39
Upstream of weir near Observatory Road	0.53
Downstream of Observatory Road	0.53
Junction with Black River	0.48
Salt River	
Downstream end of TRUP before rail bridge	0.53
Upstream of Section Road bridge	0.26
Mouth	0.00

Fig.9 1:100 year flood with scenario 6 urban plan, difference with November report.

NOTE: UPDATED SPECIALIST STUDY: FLOOD MODELLING AS OF AFTER 10 FEBRUARY 2017



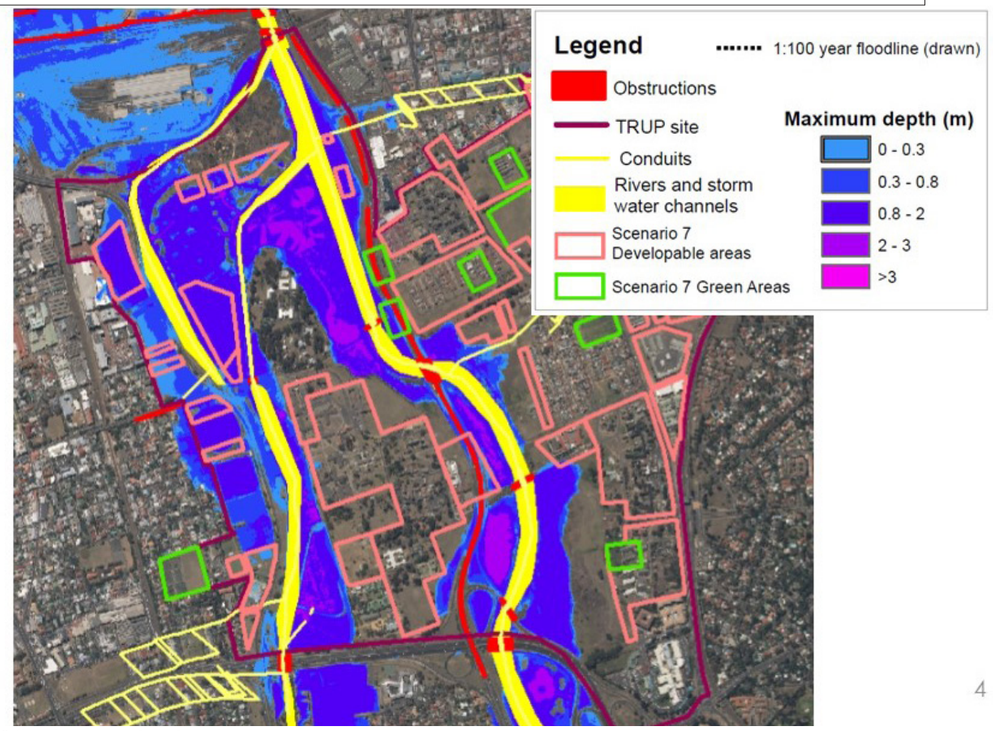
Legend

- TRUP site
- Conduits
- Rivers and storm water channels
- 1:20 year flood
- 1:50 year flood
- 1:100 year flood

Increase in flood level 1:100 year (m)	
Black River	
Downstream of N2	0.31
Downstream of Valkenburg Bridge	0.37
Downstream of M5 bridge	0.39
Liesbeek River	
Downstream of N2	0.05
Downstream of weir near Wild Fig	0.12
Downstream end of ponds near Wild Fig	0.39
Upstream of weir near Observatory Road	0.53
Downstream of Observatory Road	0.53
Junction with Black River	0.48
Salt River	
Downstream end of TRUP before rail bridge	0.53
Upstream of Section Road bridge	0.26
Mouth	0.00

Fig.11 1:20, 1:50 and 1:100 year flood current situation

NOTE: UPDATED SPECIALIST STUDY: FLOOD MODELLING AS OF AFTER 10 FEBRUARY 2017



Legend

- 1:100 year floodline (drawn)
- Obstructions
- TRUP site
- Conduits
- Rivers and storm water channels
- Scenario 7 Developable areas
- Scenario 7 Green Areas

Maximum depth (m)

- 0 - 0.3
- 0.3 - 0.8
- 0.8 - 2
- 2 - 3
- >3

Fig.10 1:100 flood current situation, depth

NOTE: UPDATED SPECIALIST STUDY: FLOOD MODELLING AS OF AFTER 10 FEBRUARY 2017

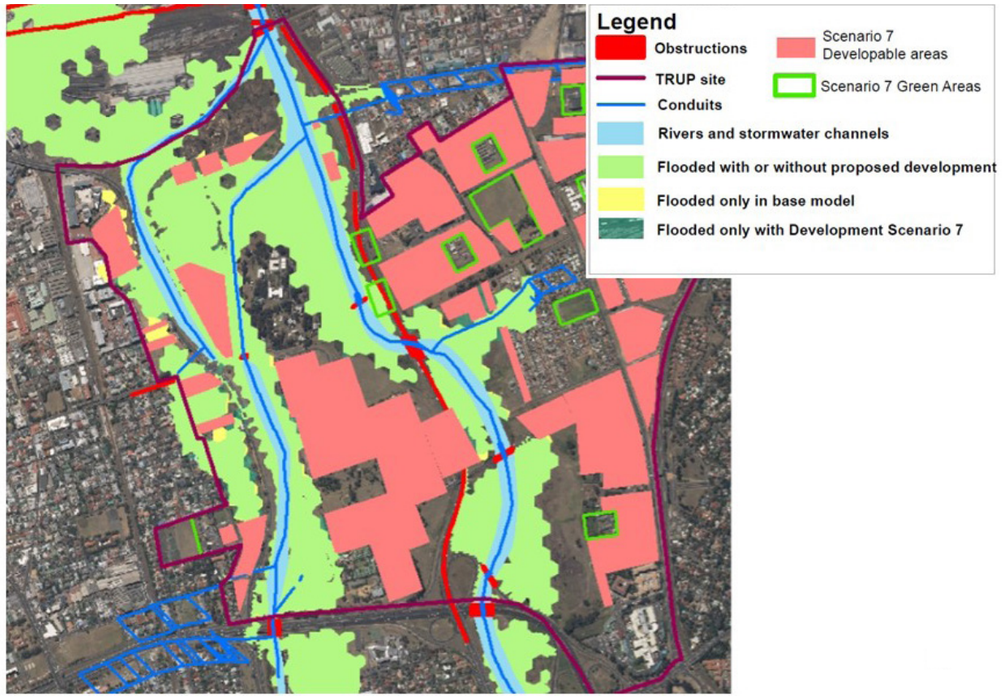


Fig.12 1:50 flooding with Scenario 7

NOTE: UPDATED SPECIALIST STUDY: FLOOD MODELLING AS OF AFTER 10 FEBRUARY 2017

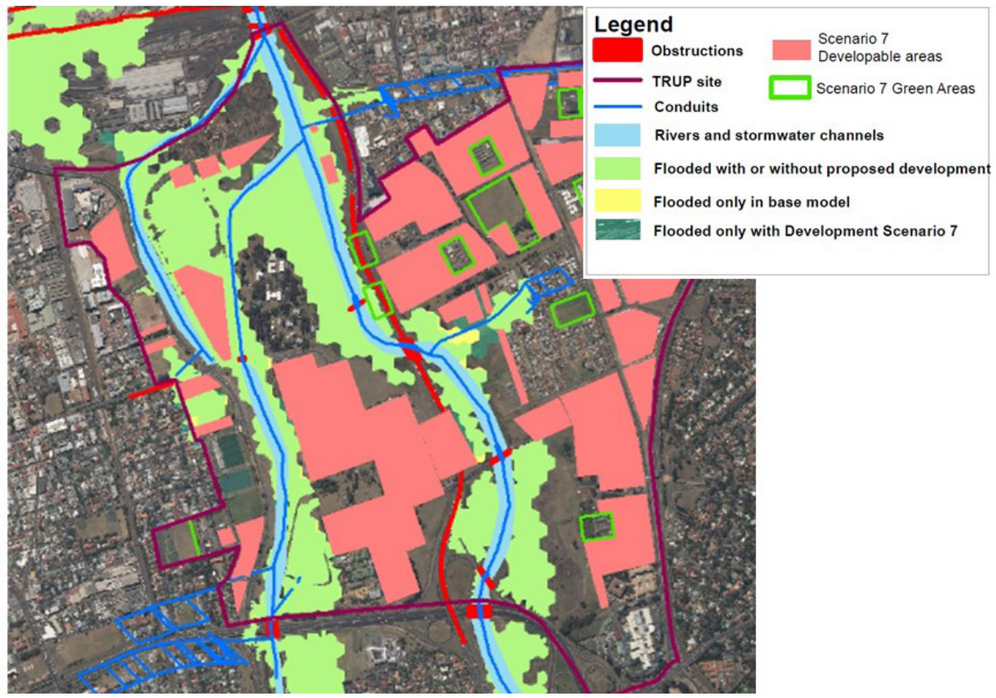


Fig.13 1:20 flooding with Scenario 7

10.8. ESM: Transportation Systems

The ESM: Transportation Systems study has not yet been released. A preliminary presentation of the study was given given at the 9th TRU-Park Stakeholder Workshop in November 2016.

Congestion is growing in Cape Town. The long term policy aims has shifted and embraced the Transit Oriented Development.

The Transport model does say:

- We can't eliminate congestion, we can only manage it – so we need to move toward more sustainable systems
- Downstream and upstream constraints limit the use of roads
- Need a "critical mass" of public transport ridership

The Transport model does not say:

- How flexible people are – or will be – in their travel choices
- The size of the market for alternative lifestyles
- To what extent people don't do certain things because they don't want to, or because they can't do them safely and enjoyably

What is planned ?

- Roads: Berkley Rd, Voortrekker Rd
- Rail: infrastructure and rolling stock upgrades
- MyCiti routes:
- Assumed low level of growth
- Best to extend existing system rather than create something new at the wider scale, but can be innovative at the local scale

The concept includes the following ideas:

- Berkley Rd for general traffic
- Station Rd for public transport and NMT
- Remote parking
- 'Covertable' parking
- Flexible transport modes
- Vehicle sharing [Locomute]
- Bicycle rental
- NMT routes
- Shared, active spaces

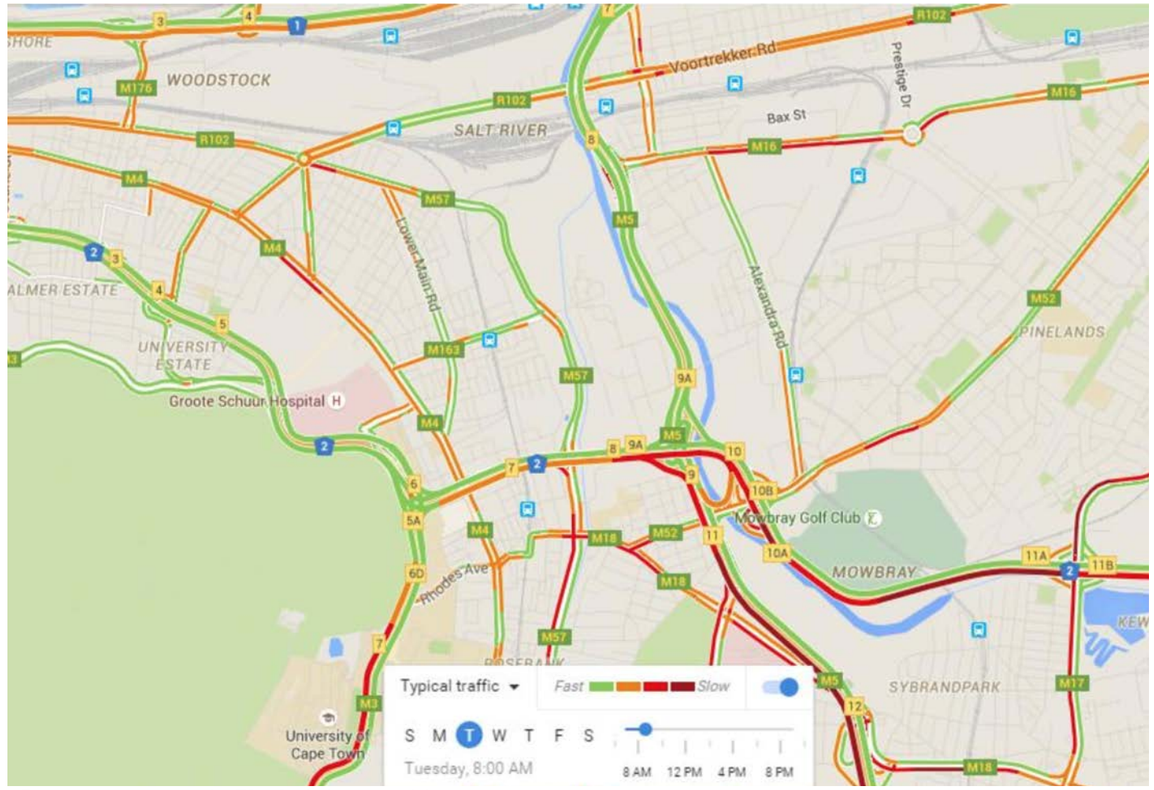


Fig.14 Congestion in the TRU-Park during peak hour

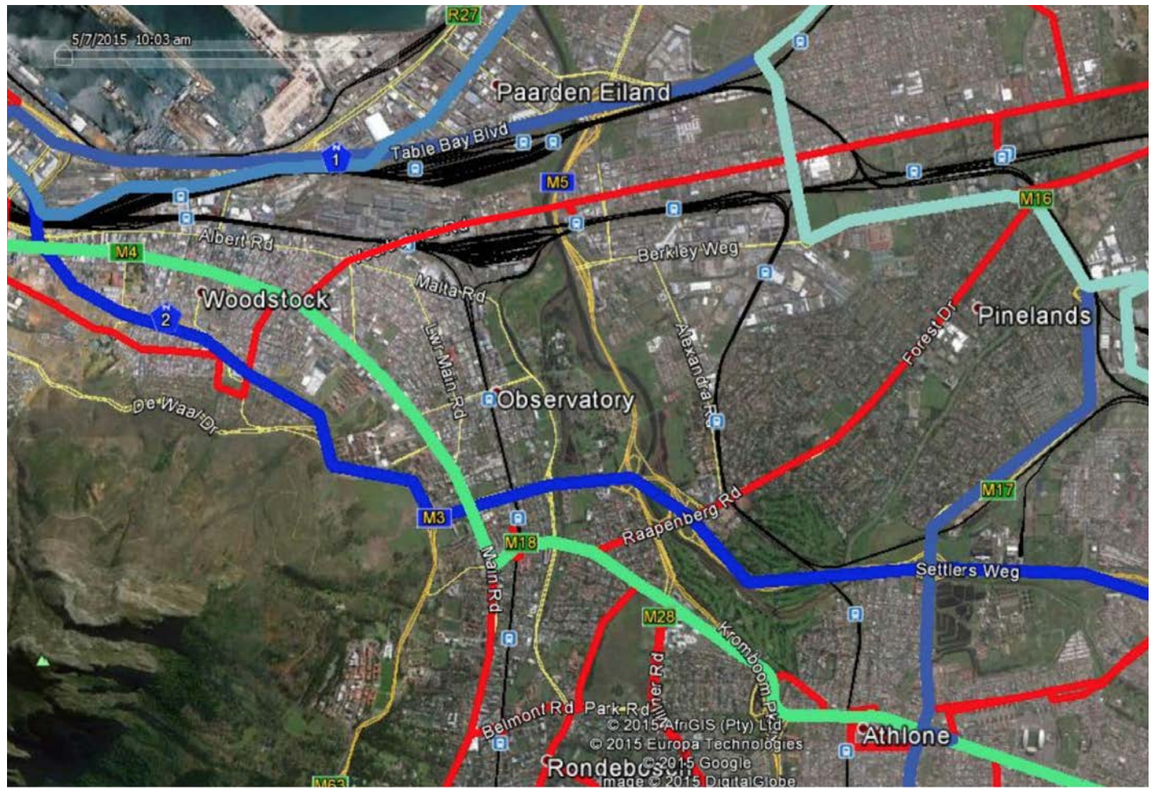


Fig.15 Planned MyCiti routes

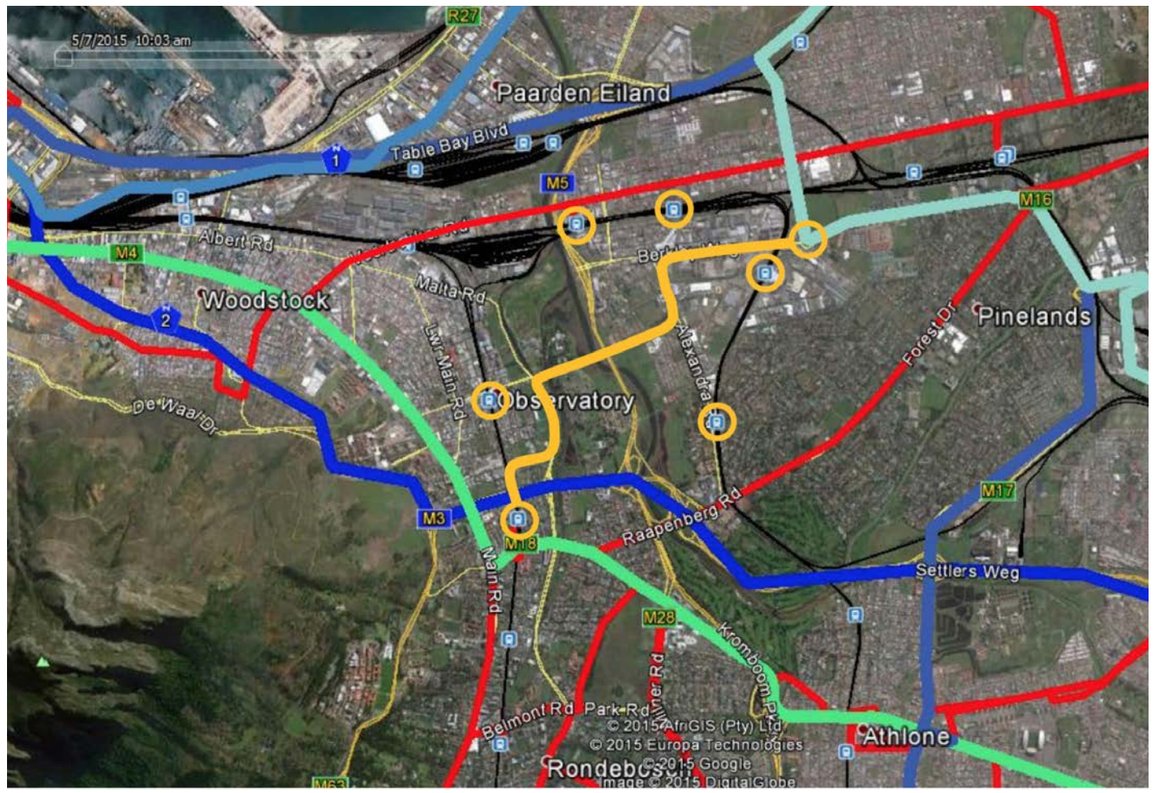
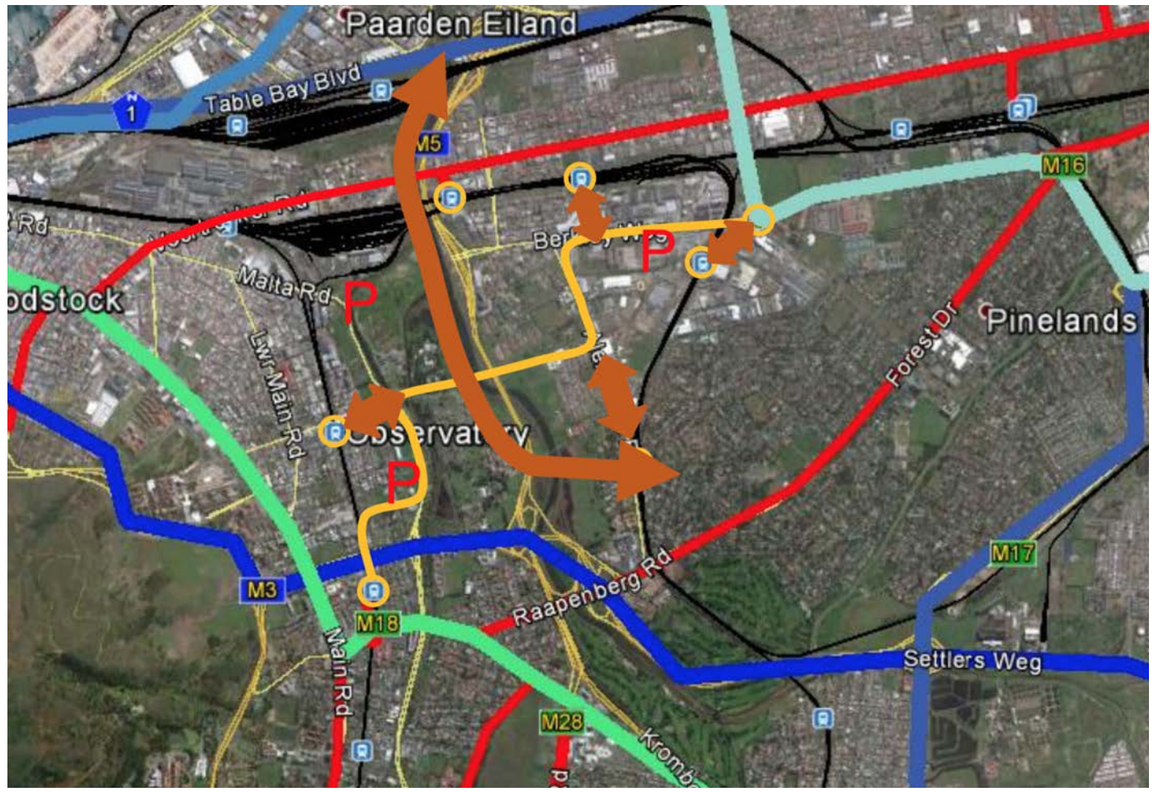


Fig.16 Proposed improved connectivity



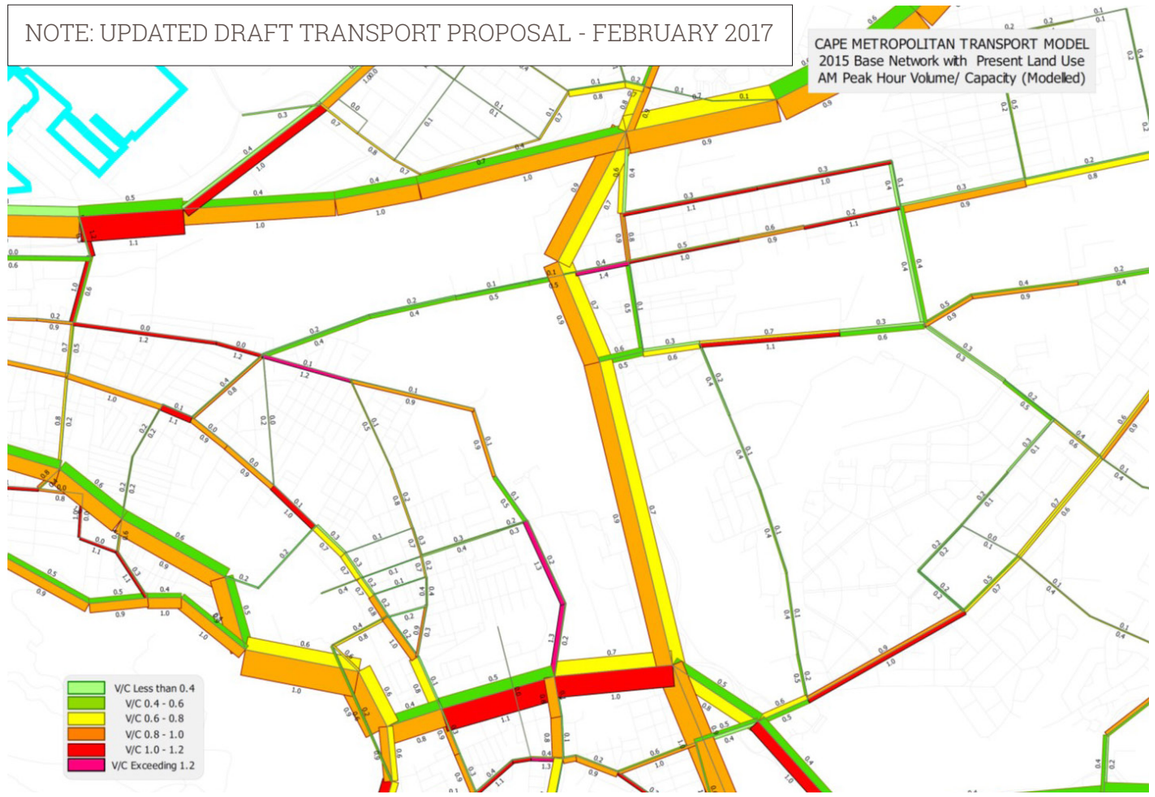


Fig.17 Base year transport model - AM Peak hour volume/capacity

Fig.18 Base year transport model - Peak Period

Modelled Demand		
Private vehicles	Standard Assumptions	Behaviour Change
Inbound	7 900	3 400
Outbound	12 270	7 980
internal	860	1 680

Fig.19 Modelled Demand

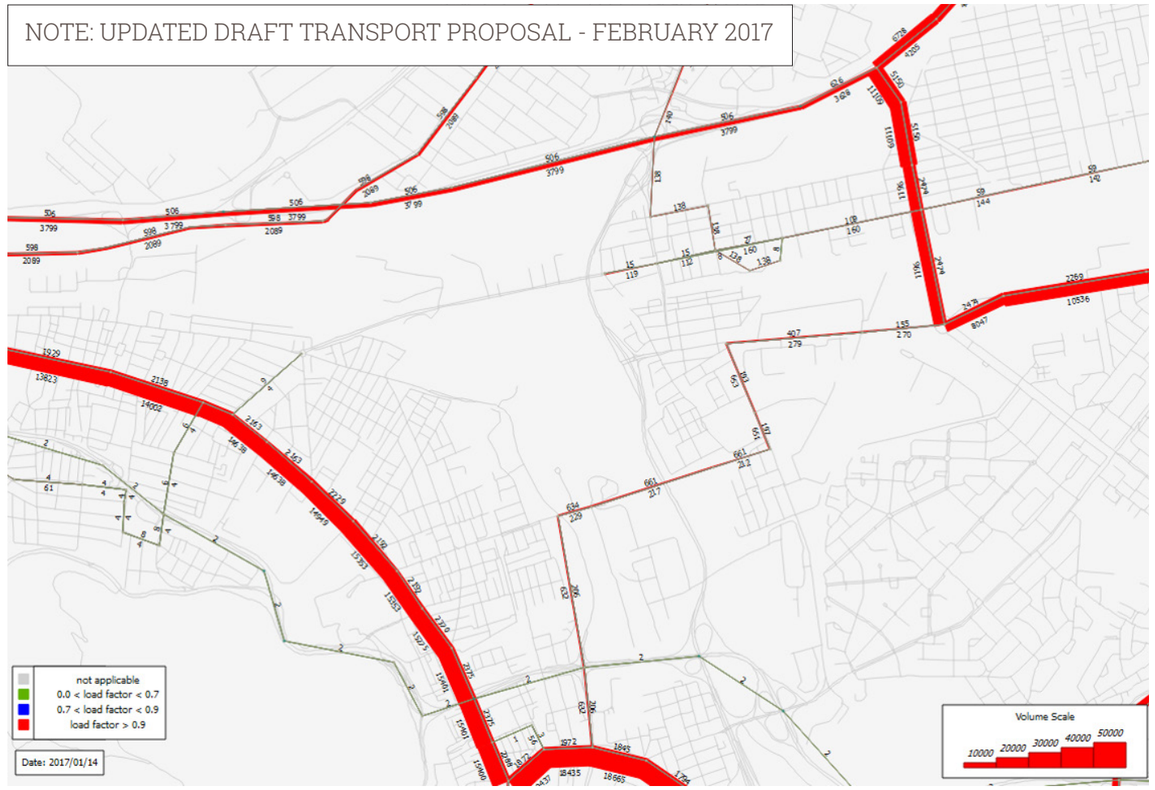


Fig.20 Base AMPH MyCiti Passenger Volumes and Load factor

NOTE: UPDATED DRAFT TRANSPORT PROPOSAL - FEBRUARY 2017

Parking:

Total parking with allowance for shared bays and car ownership (at 30:20:50 income split)::

- On-site 9 700
- Off-site 10 820
- Total 20 520 (11 700 residential)

Residential parking could be lower witha different mix of income levels and more radical parking for social income hh:

- 30:20:50 8 250
- 40:40:20 5 750

Early phasing objectives:

- Expand range of options to overcome gaps and increase choice
- Set up systems to develop standards and incentives and controls
- Establish indentifiable character of TRUP transport systems - social compact
- Asttract small-scale innovative businesses
- Establish path for new approaches to transport
- Rail is a challenge and MyCiti is not high priority
- Establish feeders to rail and parking
- Develop parking that can be converted or moved
- Strong NMT/ shared use netwok
- Set up bike share with establishment of park
- Establish multipurpose hubs

Phasing of roads:

- Alexandra to support NMT and shuttles
- Station RD extension for NMT and shuttles and public transport
- Berkley widening to support traffic at north
- Berkley extension tied to River Club
- Voortrekker Rd upgrade assumed

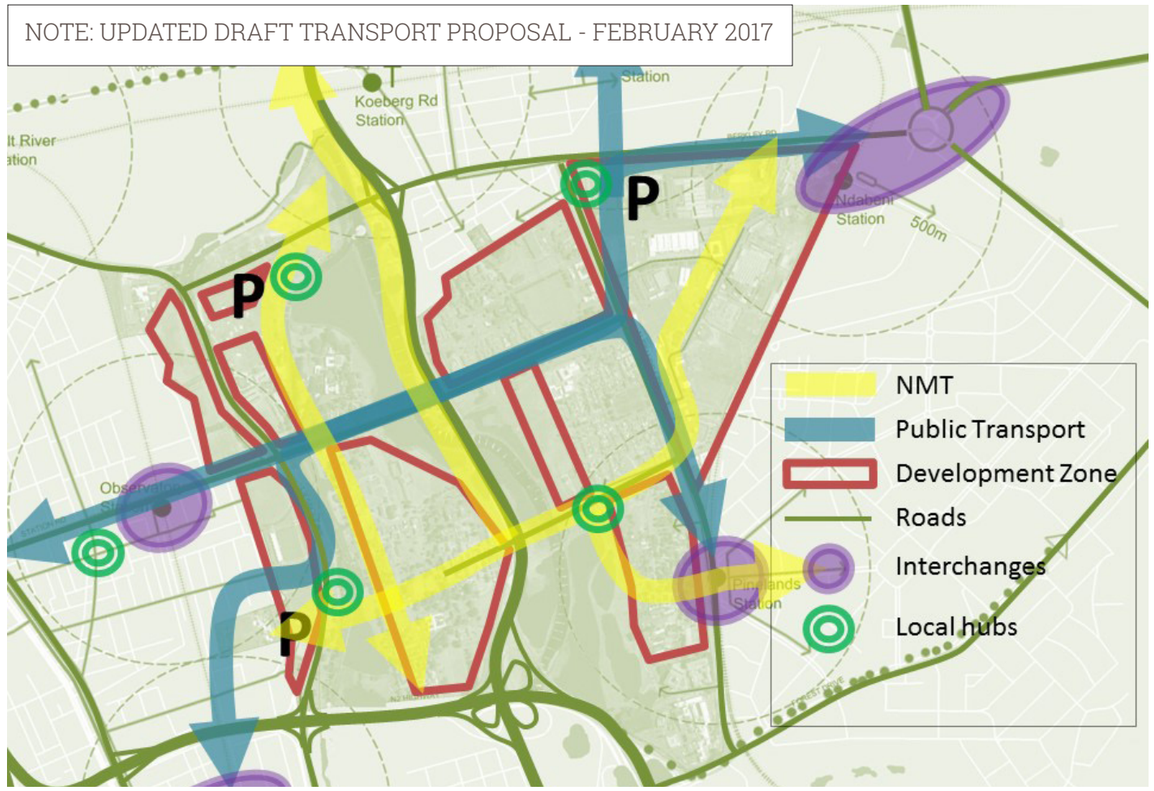


Fig.21 Early phasing

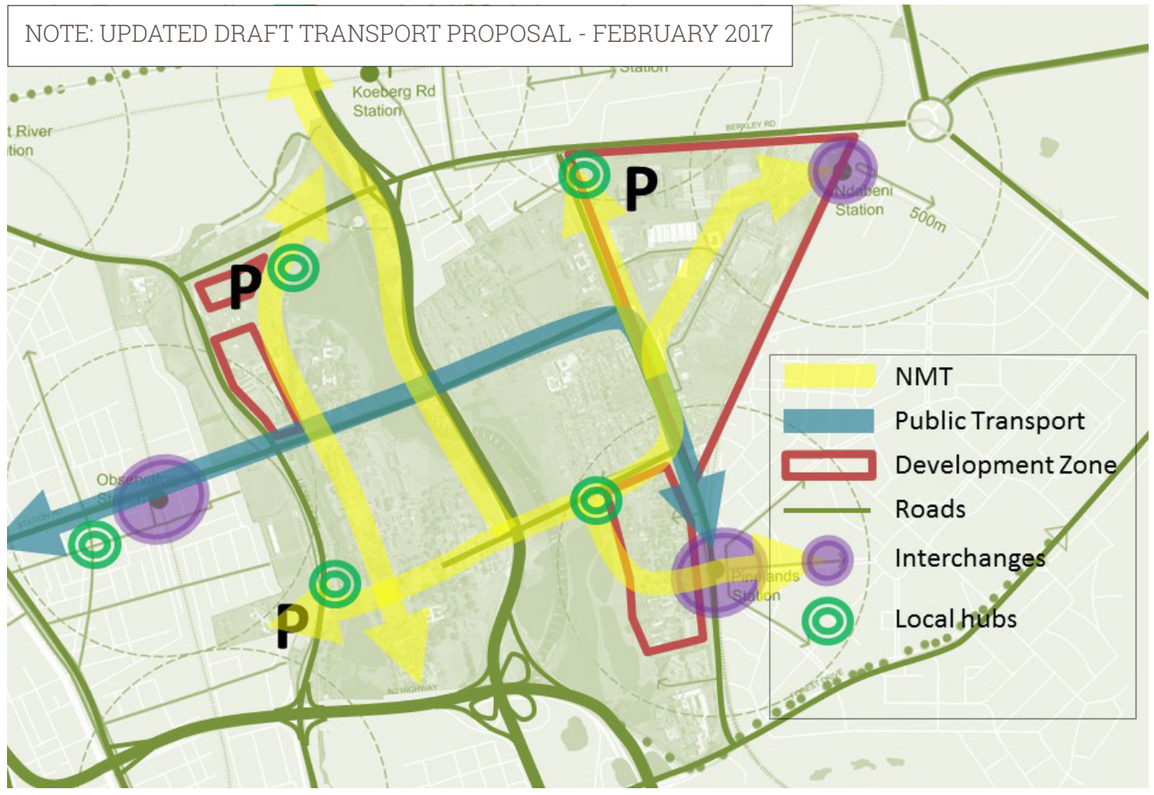


Fig.22 Phasing of roads

notes

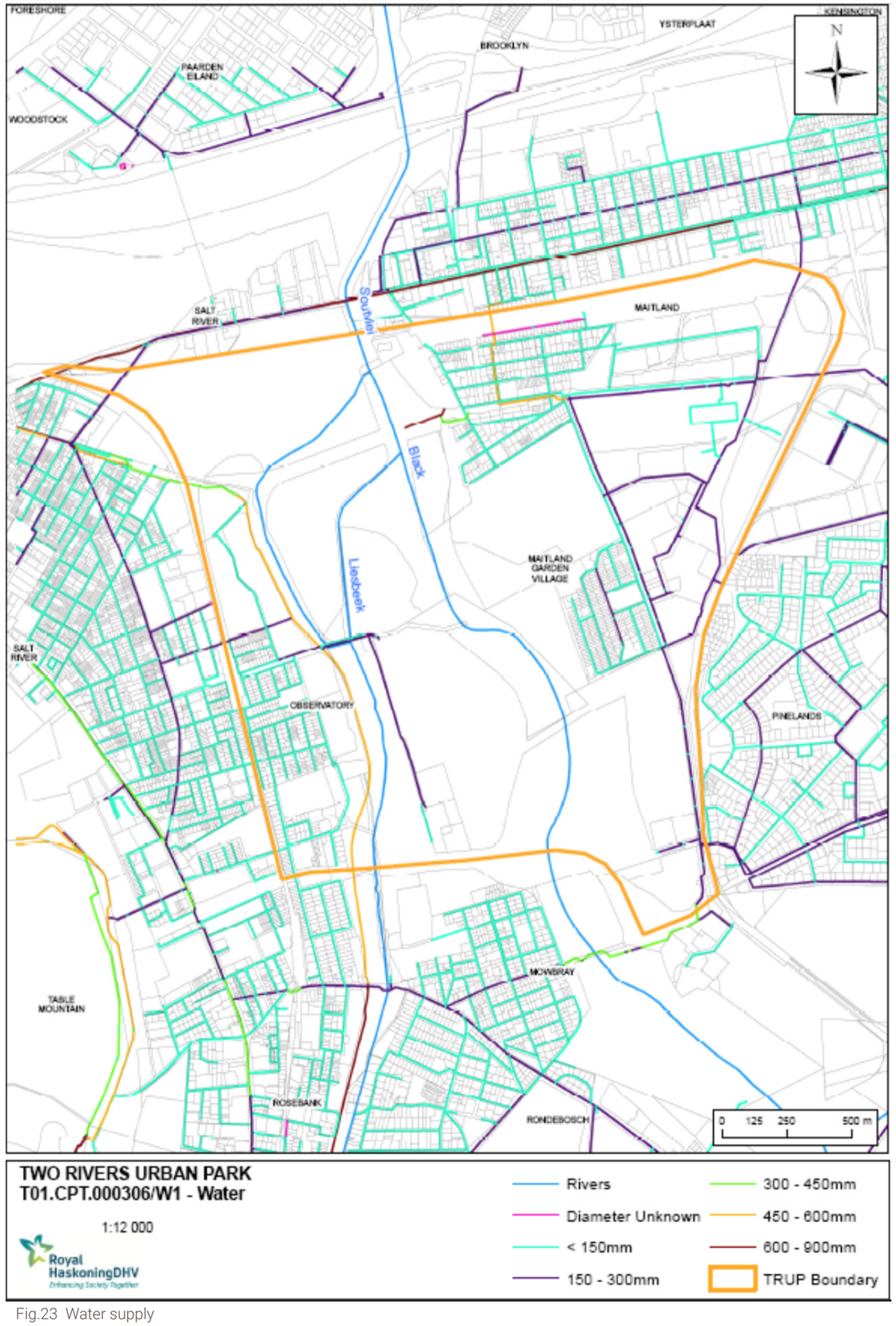


Fig.23 Water supply

10.9. ESM: Water and Sanitation Infrastructure

The ESM: Water and Sanitation Infrastructure study has not yet been released. A preliminary presentation of the study was given at the 9th TRU-Park Stakeholder Workshop in November 2016.

Water supply

The site is serviced with water supply through two existing supply zones

Western section serviced from Molteno Reservoir. Existing 450 dia. bulk supply pipeline has spare capacity of approx. 87 l/s

Eastern section serviced from Voortrekker Rd bulk main. Existing 535 dia. bulk pipeline has spare capacity of approx. 79 l/s

TOTAL SPARE CAPACITY ON EXISTING SYSTEM = 166 l/s during peak demand

Proposed development concept: Water demand approx. 421 l/s during peak demand without water saving measures.

Thus approx. 40% of conceptual development can be serviced without any upgrades & and water savings.

Water saving measures considered:

- Water management devices, awareness campaigns, pre-paid water meters, sliding scale rates (incl. penalties & incentives)
- Water pressure management
- Grey & roof water flushing systems
- Efficient water use devices
- Irrigation using treated effluent and/or rain water harvesting/river water
- On-site bulk water storage (and treatment)

Estimated impact of water saving measures could lower development water demand from 421 l/s to 214 l/s, thus still leaving a shortfall on existing system = 48 l/s (approx. 20-25% shortfall)

Limiting development to suit existing water supply can service 10 952 residential units, 8 schools, 117 679 m2 institutional & 165 232 m2 commercial development.

Alternative supplementary water supply on site will require approval from CoCT and is currently not preferred.

Sewerage

On-site treatment of sewerage not deemed to be cost efficient and not allowed by CoCT due to risks & accompanying responsibilities.

On-site wastewater treatment works could also impose a 500m radius development barrier and/or costly measures to eliminate odours & health risks and visual impacts.

In turn this eliminates the options for effluent re-use & waste-to-energy generate (from wastewater)

Proposed that all effluent from development be pumped to the existing Athlone WWTW

Water saving measure will positively impact and limit requirement for upgrades.

Preliminary findings about water and sanitation [Novemeber 2016]

- Existing bulk water supply infrastructure can accommodate approx. 40% of the current proposed development concept
- Water use efficiency and water saving measure could increase this to 80% of the proposed development footprint
- On-site potable water storage and treatment not currently seen as an option due to associated risks
- Sewerage conveyance will require upgrade to existing bulk infrastructure for treatment at Athlone WWTW
- On-site wastewater treatment not currently seen as an option due to associated risks
- Water & Sewerage Services Model developed to be adaptable to suit development needs whilst being fully integrated with City of Cape Town existing capacity, planning and standards.
- Current findings & conclusions are conceptual and provides a guideline towards ultimate development of the site.

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

Basis of concept development:

- Bulk water & sanitation services seperately supplies the areas East and West of the black river. TheESM is aligned to indicate solutions for TRUP East & West.
- Basis of concept - *Buildable Areas Scenario 7* (from NM & Associates) is used as the starting point for concept development & solutions

Confirmations - Bulk water infrastructure

- **TRUP West:** This area is supplied with potable water from the Molteno Reservoir via an old 450mm diameter fiber-cement main located in Liesbeeck Parkway. The current available spare supply from this pipe is 115.61 l/s (assuming a limited maximum velocity of 1.2 m/s). However, it should be noted that a capacity of 28.46 l/s has been allocated to The River Club Development. Current spare capacity available to TRUP West therefore equals **87.15 l/s.**
- **TRUP EAST:** An existing 535mm diameter HDPE main running south from the Steenbras Dam, supplying a 750mm diameter bulk main in Voortrekker Road, from where 460mm & 300mm diameter pipelines in Berkley Road could supply the TRUP East area. The 535 mm main currently have an available capacity of **78.93 l/s**. (assuming a limited maximum velocity of 1.2 m/s). In order to access the available capacity new pipelines parallel to the 460mm and 300mm diameter mains will be required
- *The City of Cape Town as the Water Service Authority has the responsibility for public health and safety and will not consider an "off the grid" system. Therefore no on-site water treatment will be allowed.* The availability of the required pressure and flows to the TRUP development will required future confirmation and is dependent on ultimate development details.

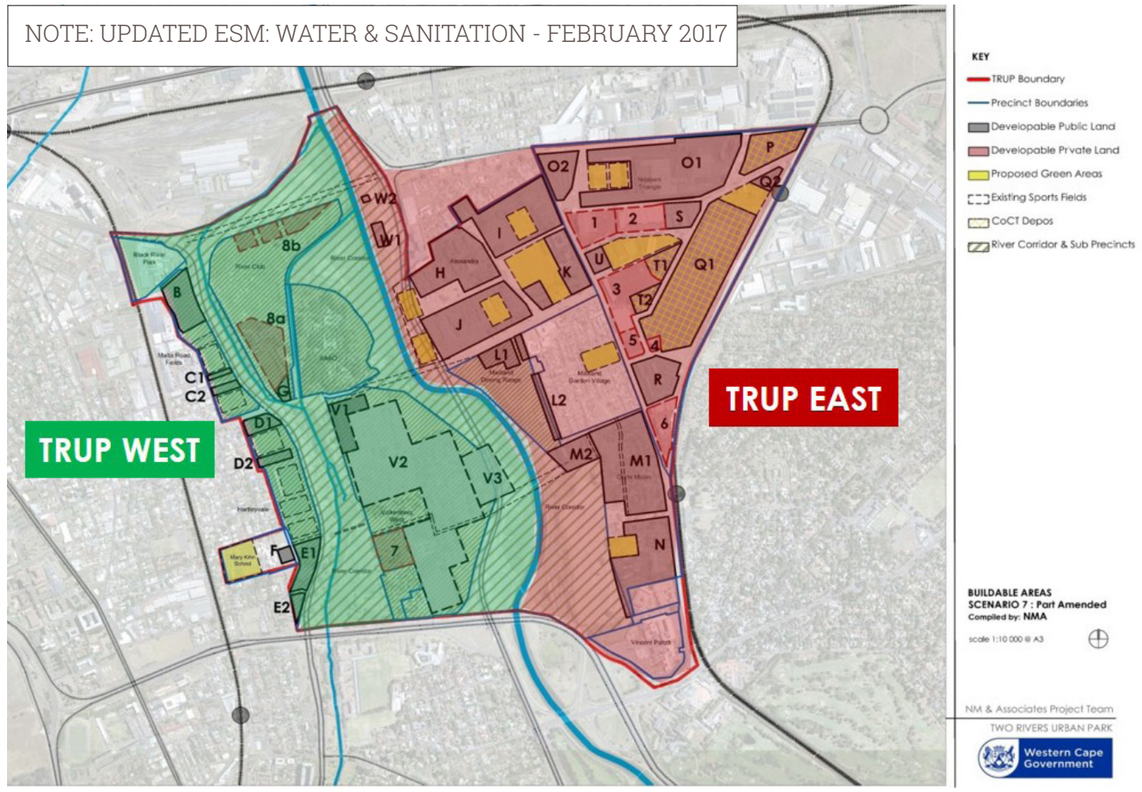


Fig.24 Basis of concept - Buidable Areas Scenario 7 (from NM & Associates)

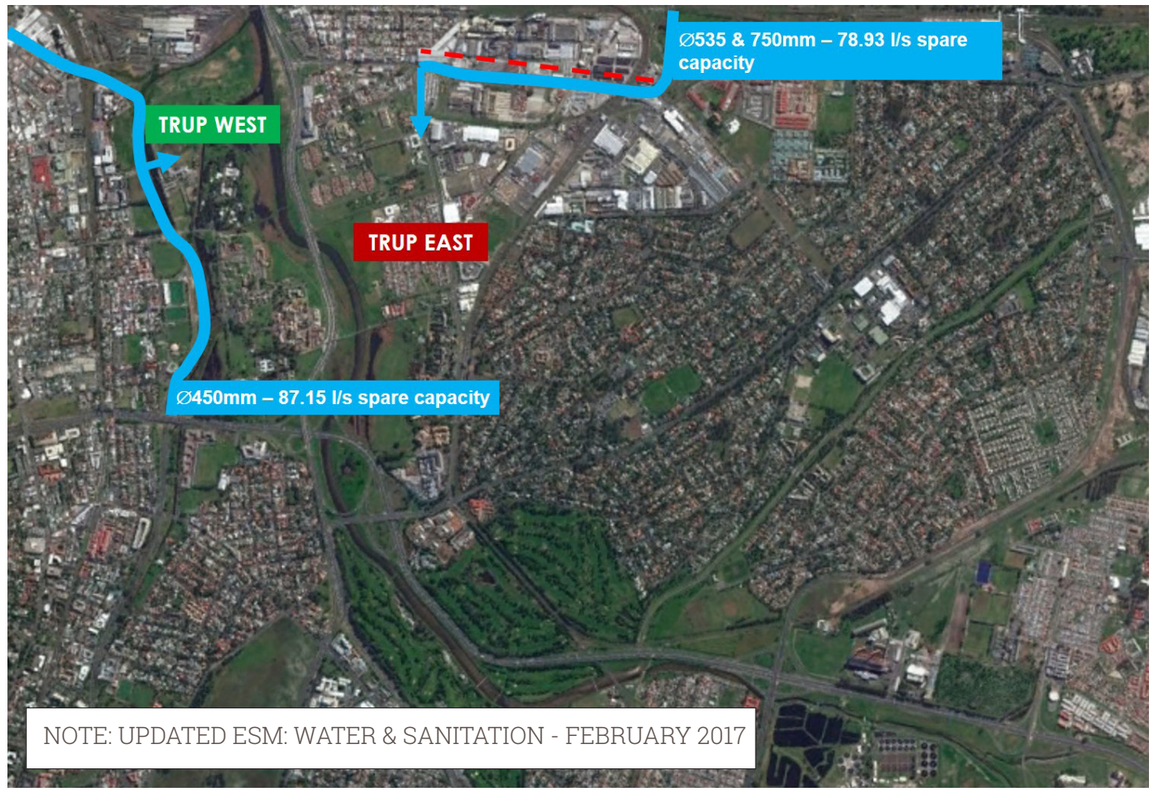


Fig.26 Bulk water infrastructure

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

TRUP WEST

Total full water demand (Peak Factor (PF)= 4)	9.56Ml/day
Total full water demand	9561 kl/day
Total full water demand	**110.66l/s**
Annual Average Daily Demand (Excl. PF)	2390kl/day

AVAILABLE CAPACITY: 87.15 l/s
Deficit 23.51l/s

TRUP EAST

Total full water demand (Peak Factor (PF)= 4)	26.63Ml/day
Total full water demand	26629kl/day
Total full water demand	**308.21l/s**
Annual Average Daily Demand (Excl. PF)	6657kl/day

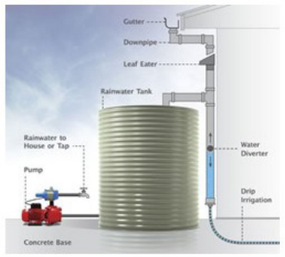
AVAILABLE CAPACITY: 78.93 l/s
Deficit 229.28 l/s

Fig.25 Comparison between Full water demand and Available capacity in TRUP East & West

Irrigation with treated effluent from existing TE systems (future)

?

Reduce water demand through water use efficiency & water saving devices



Rainwater harvesting

Greywater recycling

On-site potable water treatment

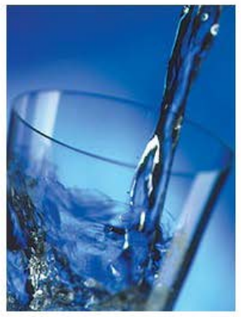
Fig.28 Bulk water supply options

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

TRUP WEST

Reduced water demand (Peak Factor (PF)= 4)	5.82Ml/day
Reduced water demand	5820kl/day
Total reduced water demand (peak)	**67.36l/s**
Annual Average Daily Demand (Excl. PF)	1455kl/day

AVAILABLE CAPACITY: 87.15 l/s
Surplus 19.79l/s



TRUP EAST

Reduced water demand (Peak Factor (PF)= 4)	15.56Ml/day
Reduced water demand	15558kl/day
Total reduced water demand (peak)	**180.06l/s**
Annual Average Daily Demand (Excl. PF)	3889kl/day

AVAILABLE CAPACITY: 78.93 l/s
Deficit 101.13 l/s

Fig.27 Comparison between Reduced water demand and Available capacity in TRUP East & West

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

Recommended solutions - Water Supply

TRUP WEST:

- Implementation of all water use efficiency measures
- New connection to Liesbeek Parkway 450mm dia. main
- Internal reticulation, metering and flow control
- Allowance for future greywater treatment plant & isolated reticulation

TRUP EAST:

- Implementation of all water use efficiency measures
- Upgrade a new water connection to existing 535mm & 750mm dia. mains
- A new 5 Ml on-site service reservoir and pump station (to service peak demand with restricted supply capacity from existing system)
- On-site reticulation (pressurized system)
- A 1.5 Ml/day greywater treatment plant & isolated reticulation
- OR A reduced development to suit the existing water supply capacity in TRUP East could possibly involve the following reductions in development size (Fig 27):

Total commercial developments	Reduce from	149 758	to	**62513**	m^2
Total institutional developments	Reduce from	117 708	to	**45464**	m^2
Total residential developments	Reduce from	11 025	to	**4932**	Units

Fig.30 TRUP East reductions in development size

TRUP WEST BULK WATER SUPPLY

DESCRIPTION	ESTIMATED CAPEX [ZAR]
Connection to existing CoCT bulk mains	R 300 000.00
Residential reduction of demand (water saving)	R 4 600 000.00
Commercial & Institutional reduction of demand (water saving)	R 9 700 000.00
Potable water reticulation	R 3 600 000.00
**New 0.5 Ml/day greywater treatment plant (incl M&E, noise & odour control)*	R 6 500 000.00
**Greywater reticulation pipelines*	R 3 400 000.00
Miscellaneous items/contingency	R 2 900 000.00
Professional fees, investigations & other	R 3 800 000.00
TOTAL ESTIMATED CAPEX (excluding escalation & taxes)	**R 34 800 000.00**

DESCRIPTION	ESTIMATED OPEX [ZAR/annum]
Connection to existing CoCT bulk mains	R 9 000.00
Residential reduction of demand (water saving)	R 92 000.00
Commercial & Institutional reduction of demand (water saving)	R 194 000.00
Potable water reticulation	R 108 000.00
**New 0.5 Ml/day greywater treatment plant (incl M&E, noise & odour control)*	R 650 000.00
**Greywater reticulation pipelines*	R 102 000.00
Total annual energy costs	R 416 100.00
TOTAL ESTIMATED OPEX per annum (excluding contingencies, professional fees & taxes)	**R 1 571 100.00**

TRUP EAST BULK WATER SUPPLY

DESCRIPTION	ESTIMATED CAPEX [ZAR]
Connection to existing CoCT bulk mains	R 4 350 000.00
Residential reduction of demand (water saving)	R 16 600 000.00
Commercial & Institutional reduction of demand (water saving)	R 6 700 000.00
New 5 Ml service reservoir	R 7 250 000.00
Potable water P/S (incl. M&E)	R 1 440 000.00
Potable water reticulation	R 5 400 000.00
New 1.5 Ml/day greywater treatment plant (incl M&E, noise & odour control)	R 18 000 000.00
Greywater reticulation pipelines	R 5 100 000.00
Miscellaneous items/contingency	R 6 500 000.00
Professional fees, investigations & other	R 8 600 000.00
TOTAL ESTIMATED CAPEX (excluding escalation & taxes)	**R 79 940 000.00**

DESCRIPTION	ESTIMATED OPEX [ZAR/annum]
Connection to existing CoCT bulk mains	R 130 500.00
Residential reduction of demand (water saving)	R 332 000.00
Commercial & Institutional reduction of demand (water saving)	R 134 000.00
New 5 Ml service reservoir	R 217 500.00
Potable water P/S (incl. M&E)	R 144 000.00
Potable water reticulation	R 162 000.00
New 1.5 Ml/day greywater treatment plant (incl M&E, noise & odour control)	R 1 440 000.00
Greywater reticulation pipelines	R 255 000.00
Total annual energy costs	R 1 109 600.00
TOTAL ESTIMATED OPEX per annum (excluding contingencies, professional fees & taxes)	**R 3 924 600.00**

Fig.29 Indicative life cycle costing: Water Supply

Confirmations - Sanitation infrastructure

TRUP WEST & EAST:

- The Woodstock Interceptor (1050mmØ) is the Bulk sewer servicing TRUP West. Downstream of the TRUP West at the confluence with the Maitland Interceptor (Servicing the TRUP East) on Settlers Way, the 1375mmØ has a full flow capacity of 1375.49 l/s , the current maximum flow is 918.15 l/s. Maintaining a 30% hydraulic spare capacity Qmax =962.84 l/s maximum dry weather capacity and this leaves a remainder of **44.69 l/s** unallocated capacity.
- These flows drain to the Raapenberg P/S from where it is pumped to Athlone WWTW. The Athlone WWTW is at capacity and is due for an upgrade, there is however an option to divert sewer to the Cape Flats WWTW which has sufficient spare capacity to accommodate the development. *On-site wastewater treatment will not be allowed by the City of Cape Town.*
- The Sunrise Section precinct (Q and P) (Table 7) has downstream constraints on the existing system draining to Langa Minor Pump station but the future system, after Master-plan projects have been implemented, will accommodate the **31.38 l/s** peak flow (dry weather)

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

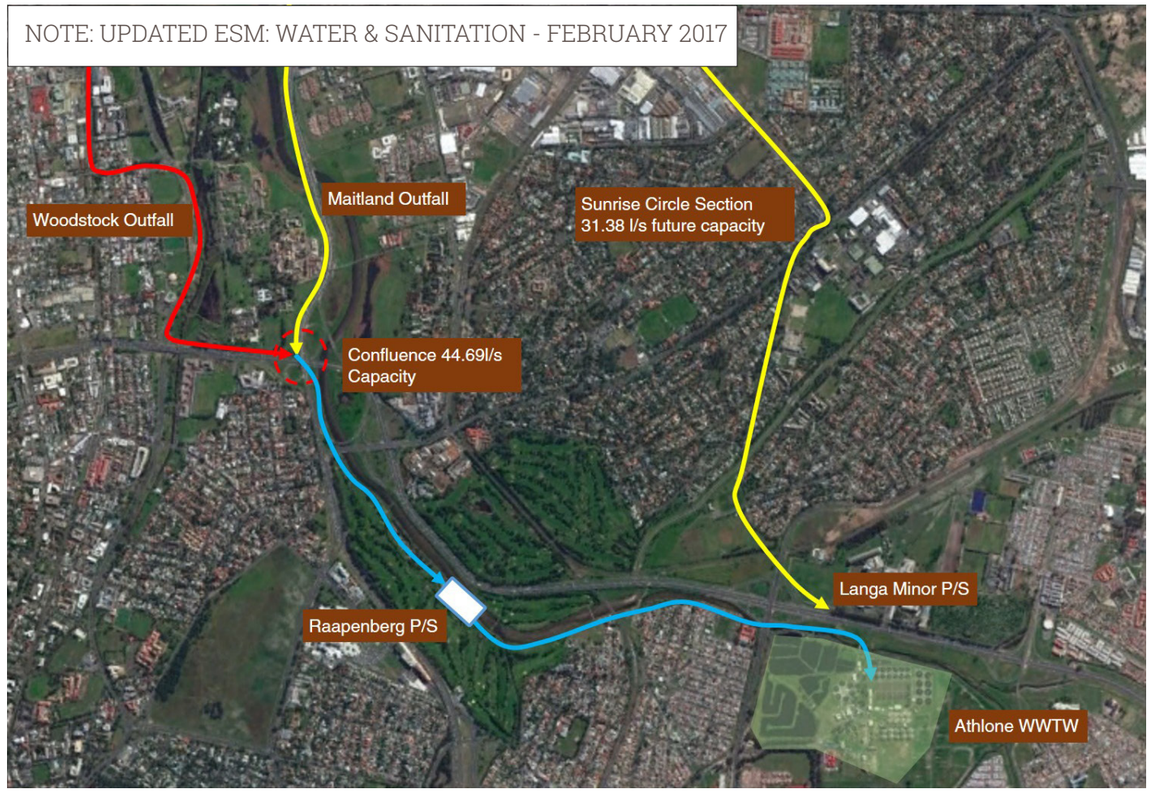


Fig.31 Sanitation infrastructure

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

TRUP WEST

Peak Dry Weather Flow (PDWF) (PF = 2.5)	2.91 Ml/day
PDWF	2910 kl/day
PDWF (Total)	**33.68 l/s**
Average Dry Weather Flow Demand	1164 kl/day

AVAILABLE CAPACITY: 44.69 l/s
Surplus 11.01 l/s

TRUP EAST

Peak Dry Weather Flow (PDWF) (PF= 2.5)	7.78 Ml/day
PDWF	7779 kl/day
PDWF (Total)	**90.03 l/s**
Average Dry Weather Flow Demand (Excl. PF)	3112 kl/day

AVAILABLE CAPACITY: 31.38 +11.01 l/s
Deficit 47.64 l/s

Fig.32 Comparison between Reduced sewer flow and Available capacity in TRUP East & West

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

Upgrade bulk sewer conveyance system

<u>On-site</u> WWTW & effluent re-use

<u>Off-site</u> wastewater treatment

Fig.33 Sanitation infrastructure options

Recommended solutions - Sanitation

TRUP WEST:

- Allocate capacity at Confluence to TRUP West first
- Waterborne sewer reticulation
- New pump station & balancing sump to discharge into Woodstock Outfall

TRUP EAST:

- Implement masterplan projects to unlock capacity on Sunrise Circle sewers & Langa Minor P/S
- Waterborne sewer reticulation
- New pump station & balancing sump to discharge limited flow into Maitland Outfall
- A new pump station & pumping main to deliver flows to Raapenberg P/S
- Upgrades to Raapenberg P/S and pumping mains
- OR A reduced development to suit the existing sewer capacity in TRUP East could possibly involve the following reductions in development size (Fig 31):

Total commercial developments	Reduce from	149 758	to	**67147**	m^2
Total institutional developments	Reduce from	117 708	to	**48834**	m^2
Total residential developments	Reduce from	11 025	to	**5298**	Units

Fig.34 TRUP East reductions in development size to suit existing sewer capacity

TRUP WEST SANITATION

DESCRIPTION	ESTIMATED CAPEX [ZAR]
Internal sewer reticulation	R 3 150 000.00
Sewer P/S (s) and balancing volume sump to feed into Woodstock Interceptor (incl. M&E)	R 2 500 000.00
Pumping main from TRUP West to Woodstock Interceptor	R 1 470 000.00
Miscellaneous items/contingency	R 720 000.00
Professional fees, investigations & other	R 950 000.00
TOTAL ESTIMATED CAPEX (excluding escalation & taxes)	**R 8 790 000.00**

DESCRIPTION	ESTIMATED OPEX [ZAR/annum]
Internal sewer reticulation	R 157 500.00
Sewer P/S (s) and balancing volume sump to feed into Woodstock Interceptor (incl. M&E)	R 300 000.00
Pumping main from TRUP West to Woodstock Interceptor	R 73 500.00
Total annual energy costs	R 693 500.00
TOTAL ESTIMATED OPEX per annum (excluding contingencies, professional fees & taxes)	**R 1 224 500.00**

TRUP EAST SANITATION

DESCRIPTION	ESTIMATED CAPEX [ZAR]
Internal sewer reticulation	R 4 200 000.00
Sewer P/S (s) and balancing volume sump (incl. M&E)	R 4 250 000.00
Pumping main from TRUP West to Raapenberg P/S	R 16 500 000.00
Allowance for tunnelling & road, services & river crossings	R 7 500 000.00
Miscellaneous items/contingency	R 3 200 000.00
Professional fees, investigations & other	R 4 300 000.00
Allowance for upgrade of pumping mains from Raapenberg P/S to Athlone WwTW	R 28 000 000.00
Master Plan projects required to unlock capacity on Sunrise Circle section to Langa Minor P/S	R 31 501 300.00
TOTAL ESTIMATED CAPEX (excluding escalation & taxes)	**R 99 451 300.00**

DESCRIPTION	ESTIMATED OPEX [ZAR/annum]
Internal sewer reticulation	R 210 000.00
Sewer P/S (s) and balancing volume sump (incl. M&E)	R 510 000.00
Pumping main from TRUP West to Raapenberg P/S	R 825 000.00
Allowance for tunnelling & road, services & river crossings	R 150 000.00
Total annual energy costs	R 1 178 950.00

Fig.35 Indicative life cycle costing: Sanitation

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

Recommendations

- Both the water and sanitation infrastructure requirements and preferred solutions provide a starting point based on the current development scenario. The purpose of the Engineering Services Model is to provide an adaptable approach & guideline that can be developed into an optimum integrated solution and these recommendations should be perceived as a conceptual iteration towards this objective.
- The development delivery vehicle and implementation concept will dictate the allocation of CAPEX and OPEX investments needed and should be further developed in conjunction with the City of Cape Town with regards to their Capital Infrastructure Contributions' requirements.
- The impact of other planned developments which will tap into the available water and sanitation capacity from the same City of Cape Town supply systems needs to be continuously checked and confirmed with each update of the Engineering Services Model to prevent over-allocation.
- The full impact of drought and associated risks relevant to the TRUP development should be assessed in more detail towards ultimate development design.
- Detailed trade-off studies are required as part of a detailed feasibility once planning is complete to ensure robust sustainability (& bankability).

NOTE: UPDATED ESM: WATER & SANITATION - FEBRUARY 2017

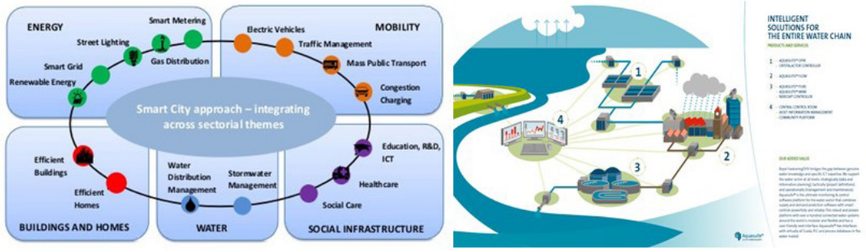


Fig.36 Possible phasing and integration

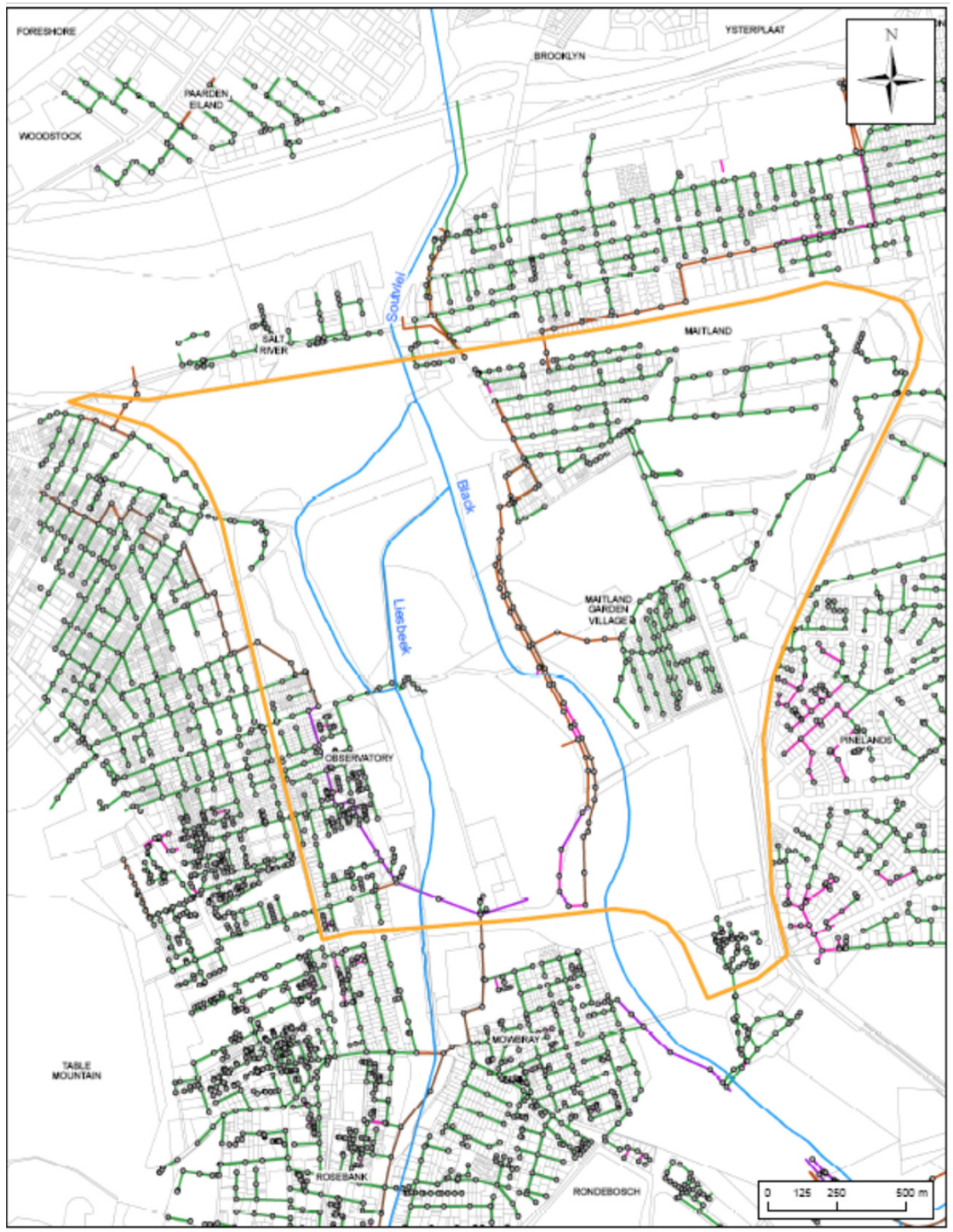


Fig.37 Sewerage

10.10. ESM: Electrical

The ESM: Electrical study has not yet been released. A preliminary presentation of the study was given at the 9th TRU-Park Stakeholder Workshop in November 2016.

The Green Priorities taken into considetration are:

- Passive Solar Architecture/Energy Efficiency
- Solar Water heating [Distributed]
- Photovoltaic [Distributed]
- Biogas/Waste to Energy [District Level]

TWO RIVERS URBAN PARK
Estimated Bulk Electricity Requirements and Associated Maximum SSEG Penetration
NMA Schedule 26 May 2016 - Includes River Club and Existing Development 2.2 mil m²
10 November 2016

Development Type	Additional Floor Area (m2)	Units	NRS 034-1:2007 Maximum Demand After Diversity (MVA)	
Residential - High-rise	1 694 655	14086	56	
Institutional				
- Schools	32 500	11	1	
- Other	226 744		18	
Commercial	212 512		17	
Parks **Sportsground** **Public Open Space**		17	0	
Totals	2 161 411		92	

Fig.38 Electrical Bulk infrastructure - NRS034-1:2007 - Shortfall 88MVA

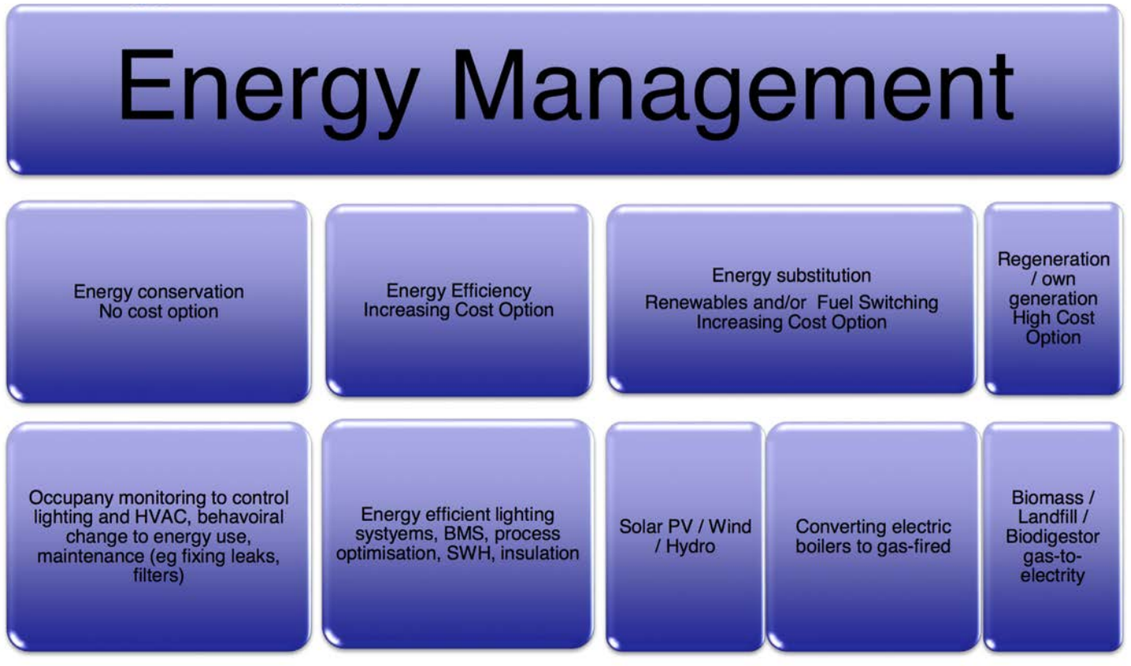


Fig.39 Energy management

Passive Solar Architecture

- Orientation – SANS 204
  - The building must be compact in Plan, with living areas and the major glazing northern facing to permit solar thermal gain during the winter. The building should have shading of the windows in summer.

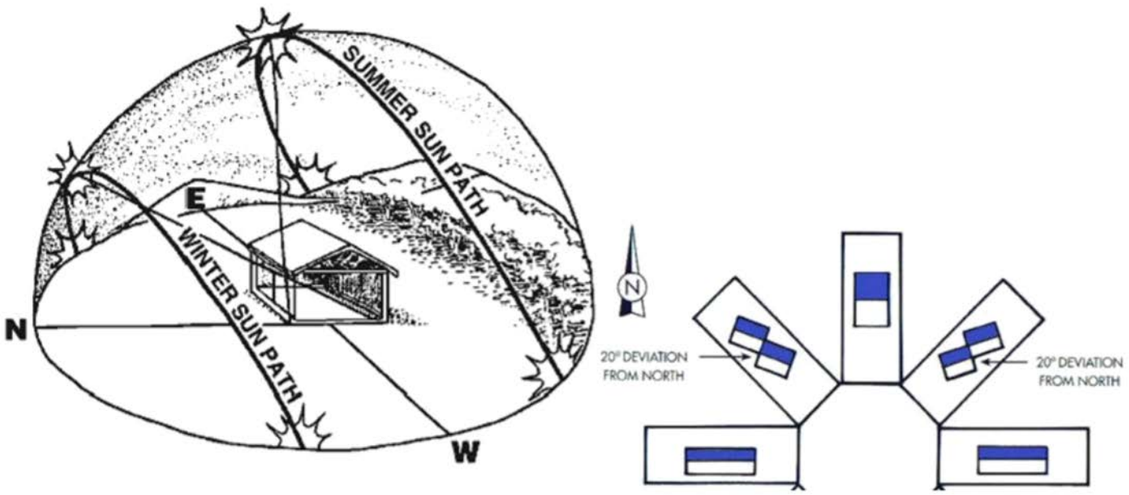
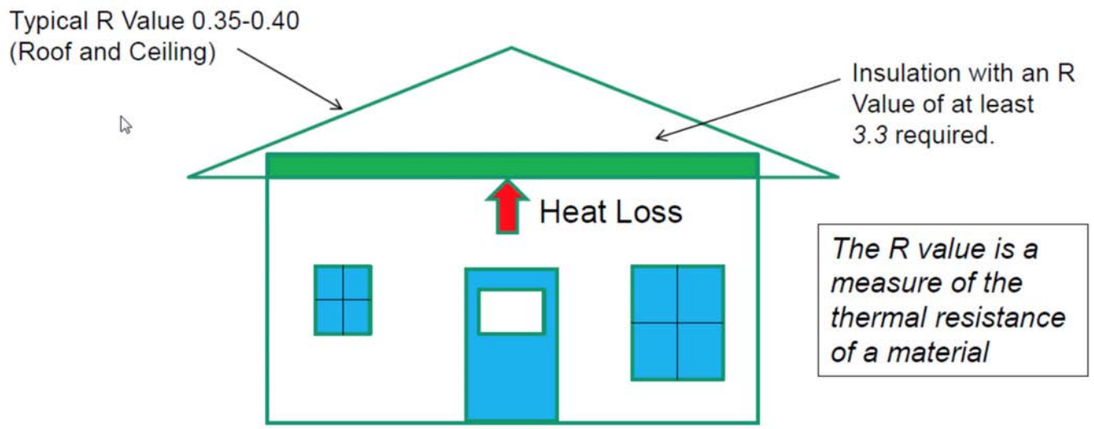


Fig.40 Passive Solar Architecture

Energy Efficiency

- Roof Assembly - Regulation XA or SANS 204

Required R Value: 3.7



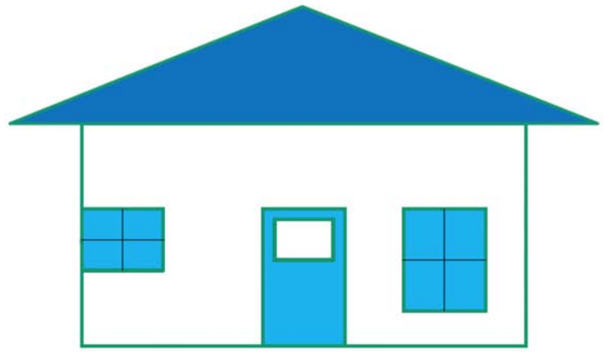
Roof Insulation Requirements

Fig.41 Energy Efficiency - roof insulation

Energy Efficiency

- Fenestration - Regulation XA or SANS 204

FENESTRATION

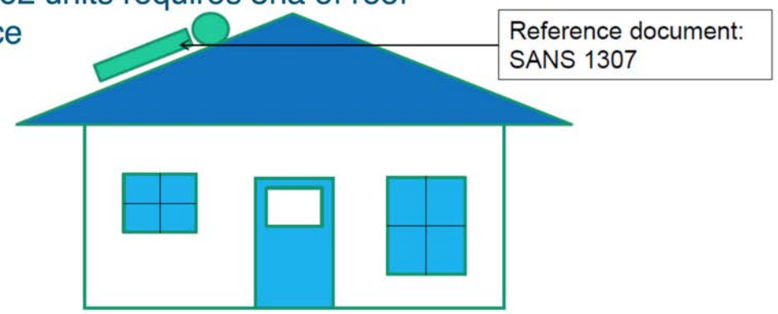


Fenestration:
If glazing area is <15% net floor area: OK
(Deemed-to-satisfy) (Note 10% minimum for light)
If not: check Conductance and Solar Heat Gain

Fig.42 Energy Efficiency - fenestration

Hot Water Requirements

- Rooftop SWH
  - 200 litre serves 3-4 people per day
  - 2035 x 1350 = 2.75m²
  - 13 962 units requires 5ha of roof space



Hot Water: 50% of the hot water requirements must be heated by means other then electrical resistance,
Typical alternate means are solar water heaters and heat pumps amongst others.

Fig.43 Hot Water requirements

TWO RIVERS URBAN PARK

Electrical Demand Modelling

NMA Schedule 12 October 2016 - Includes River Club and Existing Development

27 October 2016

Development Type	Additional Floor Area (m²)	Units	Electrical Demand: Demand per Unit (kVA)	Conventional Demand (kVA)	Proposed MD interventions (kVA)	Reduced Daily Demand (kVA)	Additional Capex (R) per Unit	Additional Maintenance (R / a / Unit)	Comments
Residential									
Township area (as per SANS 507 -1, ADMD of 2.64 kVA/unit	1 694 655	14 086	2.66						
Urban residential II (as per SANS 507 -1, ADMD of 5.31 KVA/unit			5.31						
Estimated Potential Savings	**Selected Standard**		**3.99**	**56 133**					
Solar/Gas water heating	Yes		1.33						
Gas cooking and baking	No		0.00						
Sub-total					18 664				
Residential Saving					0				
Institutional									
- Schools	27 500	11	85.00	935					
- Other	226 744		0.08	18 140					
Commercial	212 512		0.08	17 001					
Sportsground				0					
Peak Demand (kVA)				92208	18 664	73 544			No electric elements allowed in development. Dwelling breaker reduced to 20A
Current Capacity available						5000	0		
Available Electrical Supply (kVA) - CoCT 2016								CoCT	
Available Electrical Supply (kVA) - GIBB 2012 (793 619 m2 additional area)									
Shortfall						68 544			

Selection section	
Number of LSM 5 & 6 (as a percentage)	**50%**
Number of LSM 8 & 9 (as a percentage)	**50%**
Checksum	TRUE

Conventional demand 92 208kVA

Proposed MD intervention 18 664kVA

Reduce daily demand 73 544kVA

Available supply [GIBB 2012] 5 000kVA

Shortfall 68 544kVA

Fig.44 ESM: Electrical

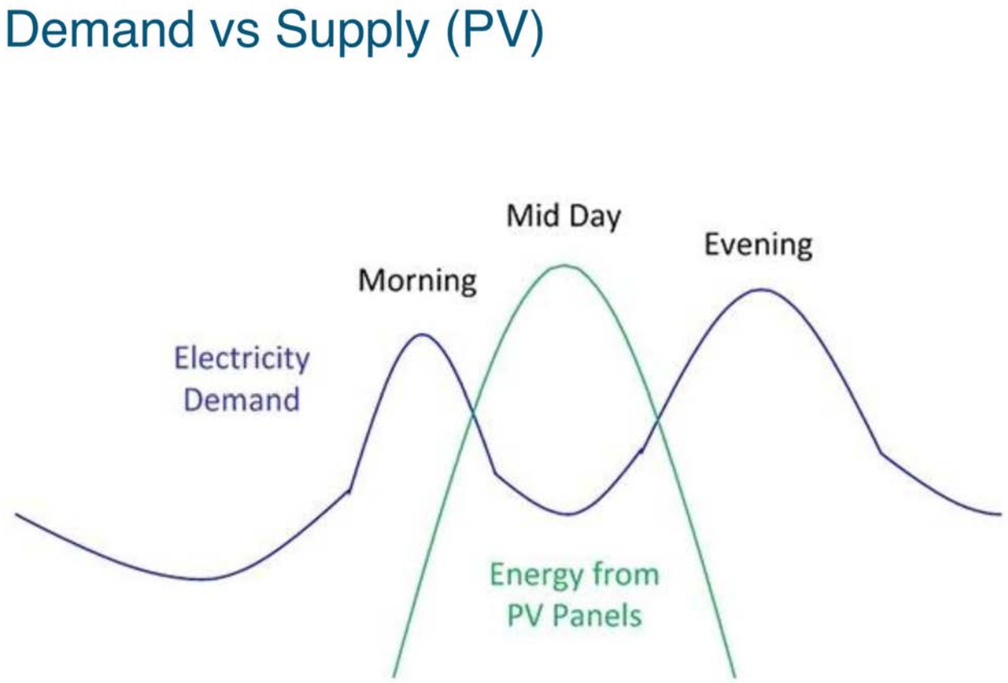


Fig.45 PV - Demand versus Supply

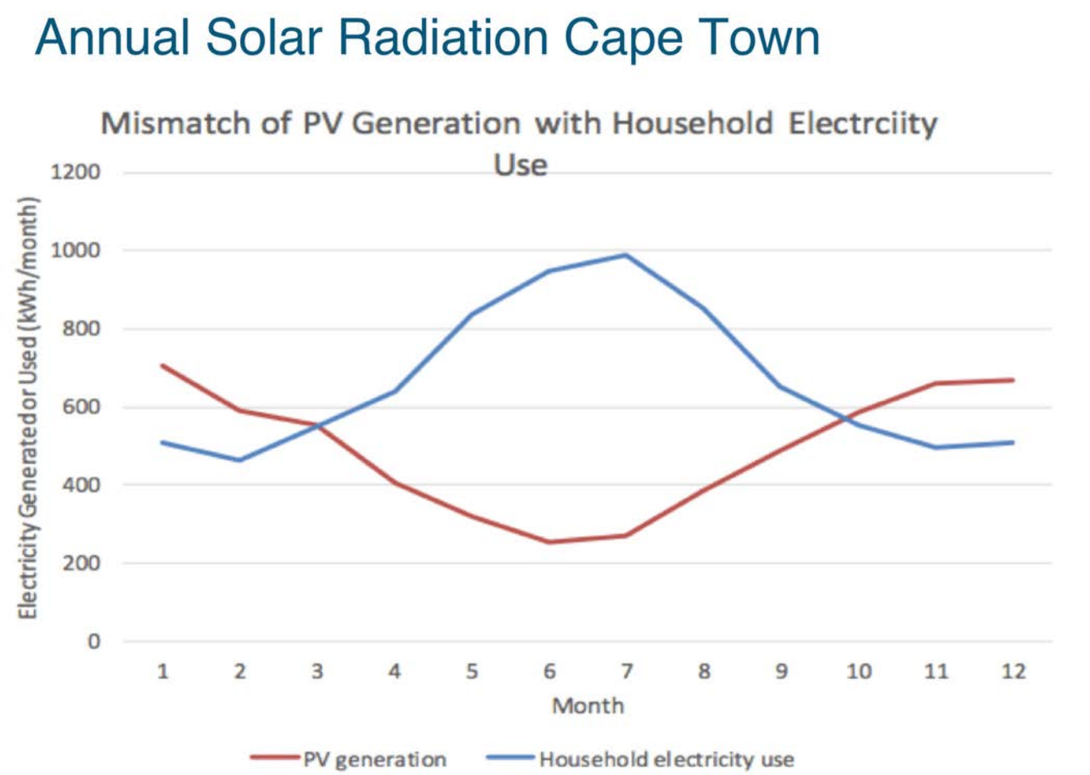


Fig.46 Annual Solar Radiation in Cape Town

TWO RIVERS URBAN PARK
Estimated Bulk Electricity Requirements and Associated Maximum SSEG Penetration
NMA Schedule 26 May 2016 - Includes River Club and Existing Development – 2.2mil m²
10 November 2016

Development Type	Additional Floor Area (m2)	Units	NRS 034-1:2007 Maximum Demand After Diversity (MVA)	
Residential - High-rise	1 694 655	14086	56	14
Institutional				
- Schools	32 500	11	1	
- Other	226 744		18	13
Commercial	212 512		17	13
Parks Sportsground Public Open Space		17	0	
Totals	2 161 411		92	14

Fig.47 Electrical Bulk infrastructure - NRS034-1:2007 - Categorised and allocate SSEG

Sustainability – NRS097-2-3:2014

Eskom SSEG Grid Code:

1. Where the RE SSEG is to be connected to a shared point of supply, such as a distribution transformer, the PV plant shall not exceed 25% of the Notified Maximum Demand;
2. Alternatively, if the point of supply is a bulk dedicated supply, for example the distribution transformer capacity is solely applied to the consumer, the PV plant shall not exceed 75% of the NMD; and
3. At no time shall the RE SSEG exceed 15% of the Medium Voltage feeder capacity.

TOR requirement - No additional Bulk Electrical Services

Budgetary Costs – Photovoltaic

- Approximately 1.1ha is required for 1MWp of PV. Area needs to be relatively flat or if roof space at normal pitches. The area must face solar north and the northern, eastern and western aspects must be clear of any shadows;
- The yield will be of the order of 1700kWh/kWp installed per annum;
- For planning purposes we can work on R20M/MWp installed without storage; and
- The installation can be distributed rooftop mounted or consolidated in a ground mounted arrangement.

Budgetary Costs – MSW to Energy

- 233 347 tons of MSW with energy content of 9.2MJ/kg will produce 17MWp;
- The yield will depend on the MSW stream but roughly speaking 100 ton of MSW per hour will provide 7kWh;
- For planning purposes work on R50M/MWp [this excludes the MSW collection, handling and storage costs]; and
- The installation would of necessity be a single consolidated installation, provided there is a MSW source.

Budgetary Costs-Municipal Effluent to Energy

- 50Ml/day yields 5000m3 of biogas which will generate 600kWp;
- The yield for biogas is 6.4kWh/m3;
- For planning purposes work on R50M/MWp [thisexcludes the wastewater treatment plant costs]; and
- The installation would of necessity be a single consolidated installation, provided there is ME source.

notes

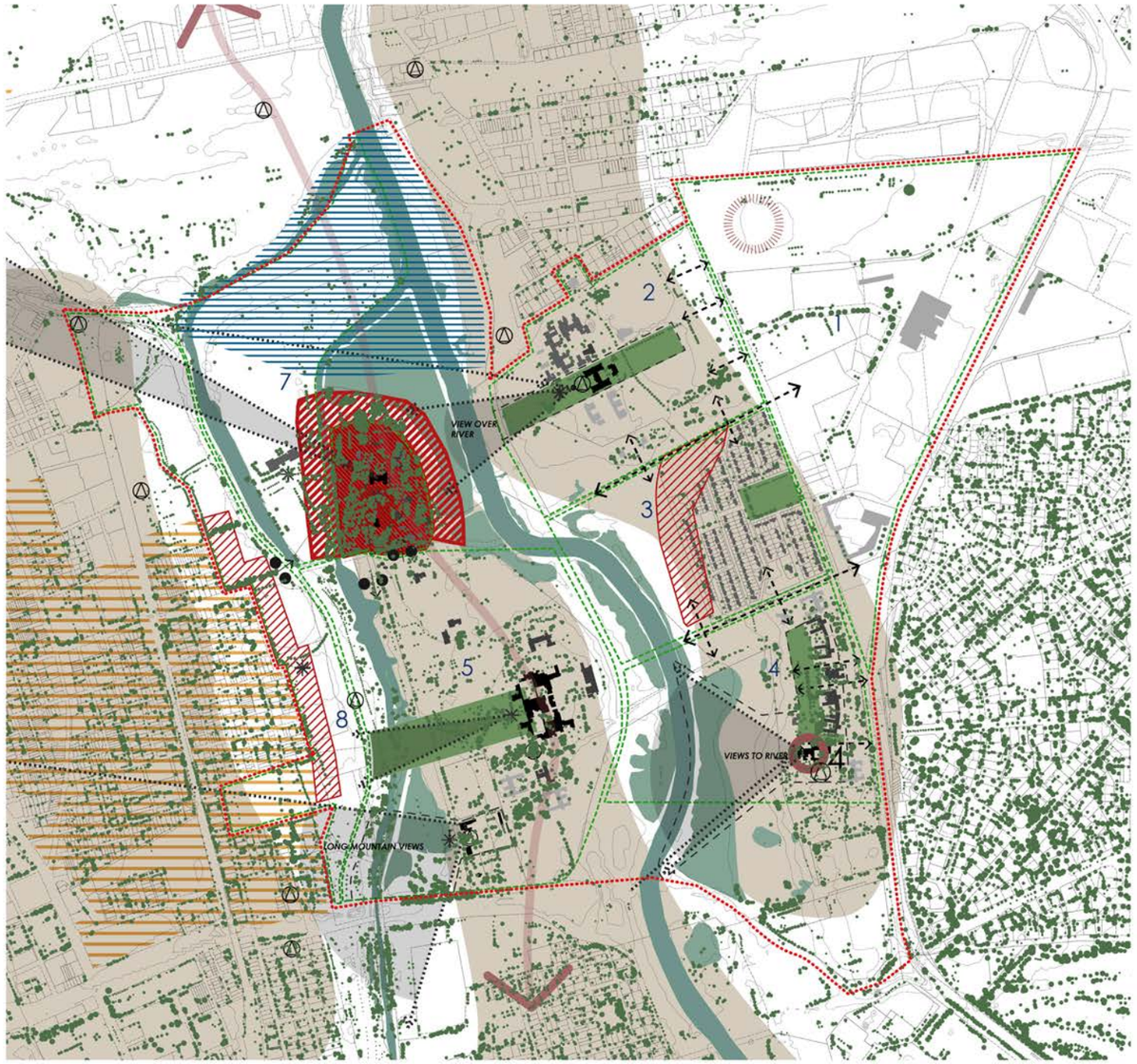
part 4_ design explorations

11.1. Topographic, Spatial and Heritage Informants

To fullfill the brief, which is to focus on maximum public access and amenity for the local and broader metopolitain community, with a significant active recreational component, that aims at connecting people across the river divide.

- The confluence of the Liesbeek and Black River corridors and their unique sense of place, these are identified as landscape charackter zones, view corridors and identifiable heritage sites.
- General sites and landscapes associated with the First Nation ancestral lands and transhumant pastoralism
- Topography of hills, summits and riverine landscapes.
- Nodal clusters of heritage buildings, institutions, werfs and residential environments.
- Landmarks and focal points positioned along the ridgelines, contributing to the sense of place
- Evidence of early linear agricultural settlements following the river patterns
- Edges, peripheries and zones of transition following the linear river pattern
- Significant views and sight lines related to heritage precincts
- Open spaces and biodiversity areas which frame the historic nodal precincts
- The sense of place arising from a unique historical character should be protected and enhanced as contributing to the landscape qualities of the area.
- The strong linear nature of the River corridor system has resulted in the areas where crossings occur becoming gateways to the site. Because of the limited nature of such river "gateways" access to the site is currently low. It does however mean that the historic gateways increase in visual, symbolic and functional sensitivity.
- Sensitive treatment of gateways entrance and river crossings involving appropriate and contextual responses to scale, massing, width and height
- Development options should not impede significant view corridors view cones and sightlines as identified.
- Excessive heights or densities of building development which obstruct or interrupt views across the river corridors towards sensitive and significant heritage sites or from heritage sensitive sites should be avoided.
- Proposed interventions in living memory sites should be considered in order to provide a presence and a dignity to historical memory and should be undertaken together with interested and affected parties.
- Mechanisms should be investigated as to how such significances may best be illustrated through commemoration and interpretation.
- Retention and recreation where possible of soft river edges and wetlands adjoining historic sites.
- Wetland areas to be considered cultural resources and retained and enhanced.
- Retention and enhancement of views across the river corridor system. Placement, geometry, density and height of development parcels to be carefully considered to enable the retention of significant views and sight lines to and from significant sites. Development proposals should allow the "breaking up" of bulk to minimise visual impact across river corridors towards the mountains.
- New development is to be orientated where possible towards the river corridors or in relation to the river corridors in order to maintain the visual and functional dominance of the riverine linear system.
- Retention and enhancement of recreational areas west of the Liesbeeck as a visual and community amenity.
- Avoidance of tall stand-alone structures which will adversely affect the linear and topographical character of the river corridors and related hillcrests.
- Removal of canalized portions of the river where possible

notes .....



River Corridor Management Plan

TOPOGRAPHIC, SPATIAL AND HERITAGE INFORMANTS SUMMARY

Compiled by TKLA

scale 1:5000 at 60 x 80 cm

0 100 250 500

KEY

- TRUP Boundary
- Wetland
- Elevated plateaus - Greywacke, phylite and quartzitic sandstone
- Land Parcels

Areas with memorialisation potential

- River Confluence, Migrational River Crossings
- Ridge Line
- Forced Removal History
- First Nation History

Structures and Areas to be Conserved

- Grade I site
- Buildings protected by s27 (PHS)
- Buildings to be conserved and context protected
- Historic green space not to be developed

Structures that may be demolished with HWC permission

- Grade IIIC structures
- Ungraded structures older than 60 years
- Potential heritage precincts

Local Herritage Protection

- Sites with historical archaeological potential
- Formally declared heritage protection overlay zones
- Green buffer zone/ development exclusion area
- Scaling mechanisms apply, potential height restrictions or landscaping
- Significant view cones
- Focal Points
- Gateway
- Permeable Edges

Landscape Character Areas

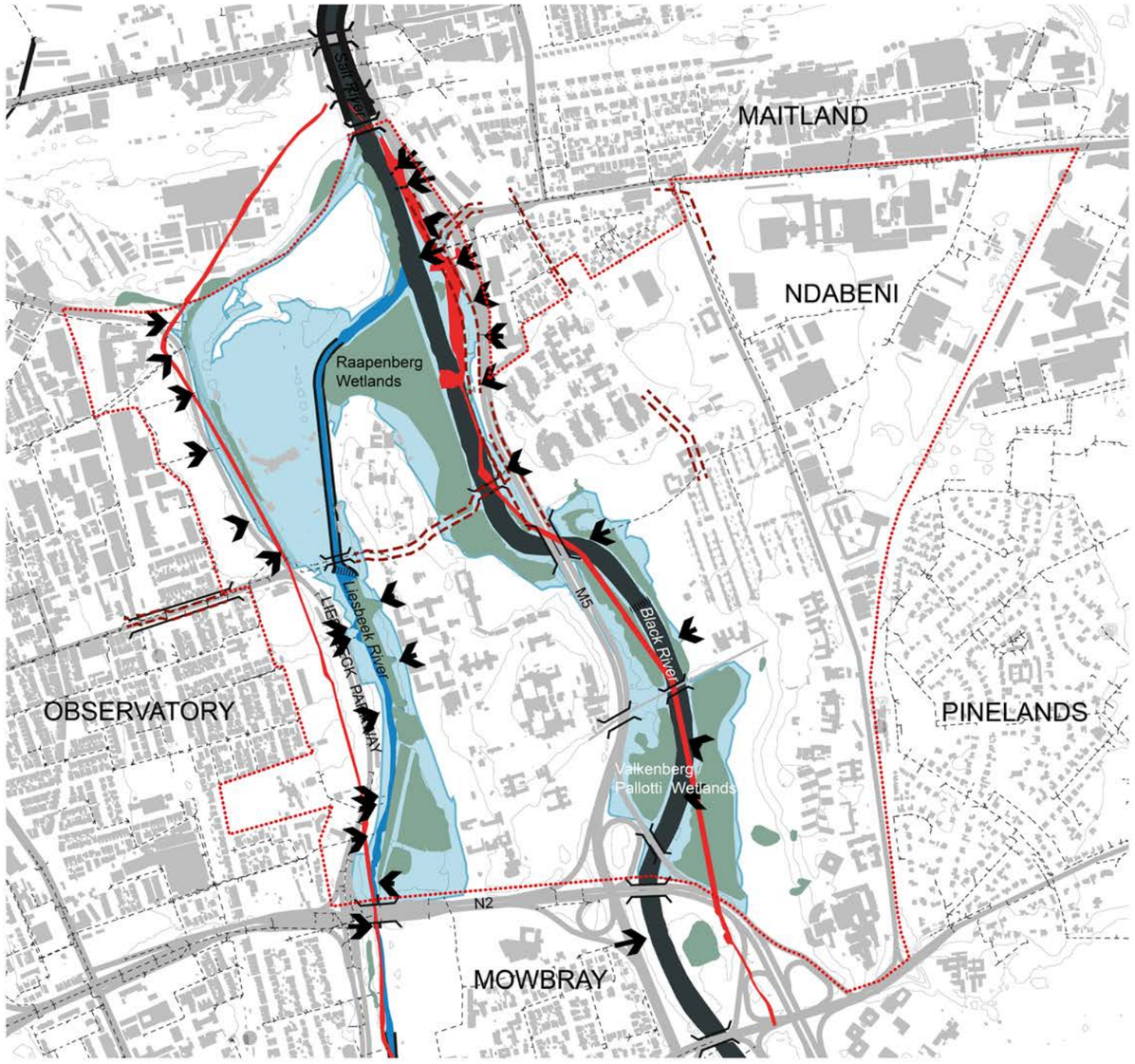
1. Ndabeni
2. Alexandra
3. Maitland Garden Village
4. Valkenberg East/ Oude Molen
5. Valkenberg West
6. SAAO and Hill
7. River Club & Vaarschedrift
8. Liesbeek Parkway Corridor

Source: Heritage adapted from Melanie Attwell and Associates 2016, Wetlands Blue Science Oct 2016

11.2. Hydrological and Infrastructural Informants

- Flooding experienced within TRUP is currently restricted to undeveloped areas except for the River Club Zone.
- Flooding is as a result of River waters backing up from the Salt River Canal due to Tidal ingress and the constricted nature of the Salt River Canal.
- Both river systems are altered river systems which has resulted in reduced wetland areas.
- Both rivers serve as drains for storm water and base flow,
- Storm water discharges into the river corridor at concentrated points, resulting in localised flooding.
- The majority of the SW outlets feed directly into the rivers with no SW amelioration.
- The impact of storm water runoff from the surrounding developed areas into the aquatic features should be mitigated
- Where possible, litter traps should be constructed to reduce litter entering the rivers.
- The functionality of the rivers and wetland areas should also be enhanced.
- The Liesbeek and the Black Rivers were both seasonal river systems.
- The Black River is currently supplemented with water from the BQWWTW and the AWWTW which contribute to constant water within the system.
- The City of Cape Town intends to reuse and reclaim Wastewater Treatment Works water and to bring the flows back to 'natural flows'.
- Canalisation and altered river embankments have reduced habitat diversity within the rivers.
- The original course of the Black River seemed to have similar meanders to the current river course alignment.
- The gradient of the Black River is only 0.5 % resulting in very slow moving water.
- The *E.coli* limit for contact recreation is regularly transgressed.
- Litter is a visual and ecological problem in the Rivers and the Ocean.
- The Malmesbury Aquifer "forms the basement to the study area" (SRK, 2013:33 is associated with poor quality water and low yields.
- Invasive alien vegetation within the aquatic ecosystems and their buffer areas should be removed and these areas kept free of alien invasive plants.
- A buffer area of 32m should be maintained adjacent to the delineated edge of the aquatic features.
- Connectivity within these corridors within the site should be maintained or restored where possible.
- Connectivity along the Black River within the site is still largely intac.t
- Observatory Road and the canalised section of the lower river have significantly impacted on the connectivity of Liesbeek River, the original alignment has been disconnected from the system.
- Rehabilitation of the lower Liesbeek River and wetlands should be undertaken according to an approved rehabilitation plan.

notes .....



River Corridor Management Plan

HYDROLOGICAL AND INFRASTRUCTURAL INFORMANTS SUMMARY

Compiled by TKLA

KEY

scale 1:5000 at 60 x 80 cm

0 100 250 500

- TRUP Boundary
- Wetland
- 100 year flood extend (May 2016)
- Concrete Lined Channel
- Weir
- Stormwater Pipes
- Stormwater Inlet

Rivers Present Ecological State

- Class D: Largely Modified
- Class E or F: Seriously/ critically modified

Clasification is not available for the Old Liesbeek River Channel.

- High Voltage Cable Buffer Zone
- Liesbeek and Black Rivers in Aerial Photography from 1937
- Existing Bridges

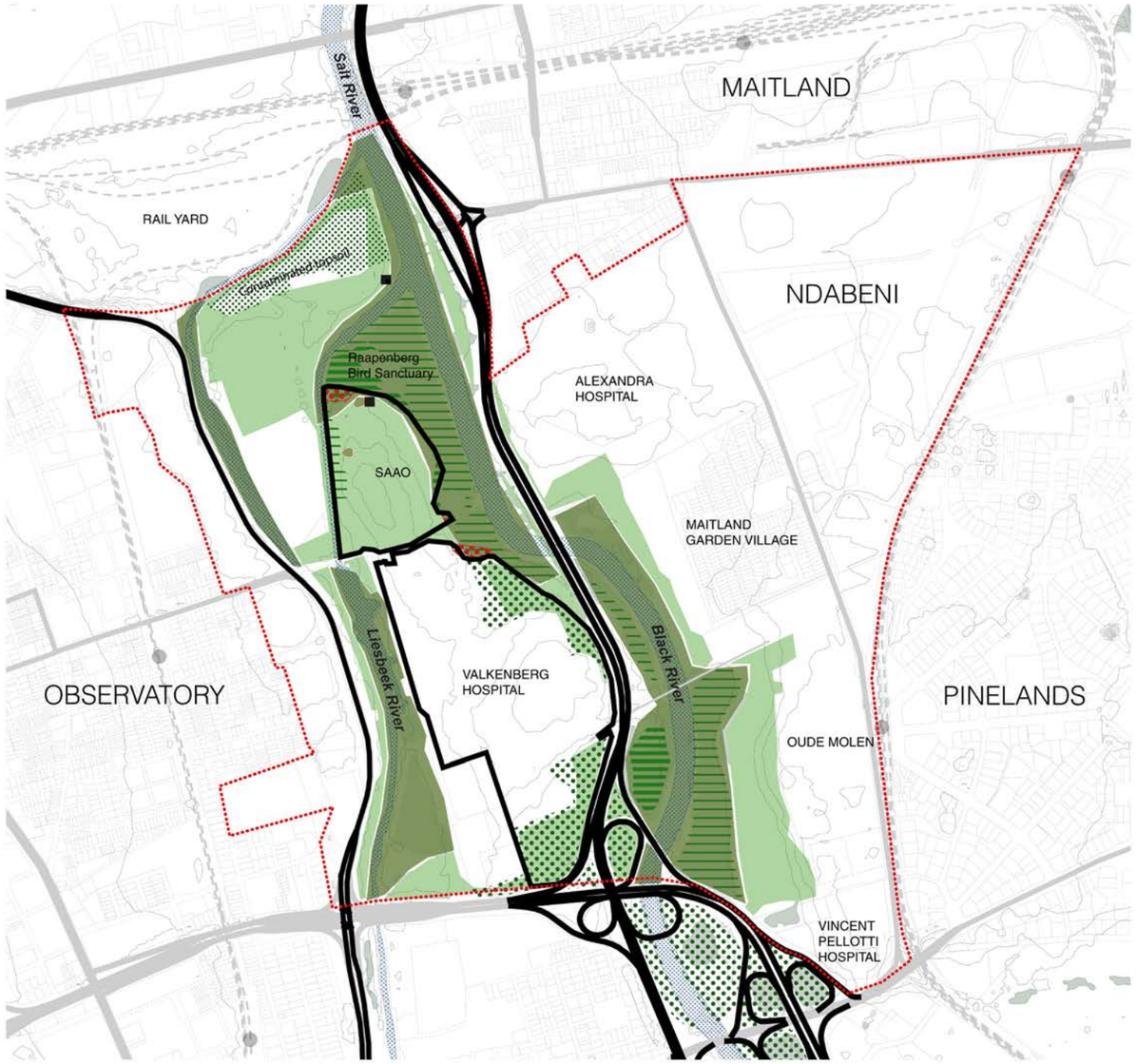
Sources: SANBI 2012, Blue Science Oct 2016, Services RHDHV

11.3. Biodiversity Informants

Inform the conservation of the sensitive habitats, potential ecological linkages, rehabilitation of river bank habitats as well as enable access by people to these areas for educational, active and passive use.

- No hard development should be undertaken in areas of High Faunal or Botanical Sensitivity.
- Limited development could be considered in the Medium Sensitivity Areas.
- Address ecological linkages , east – west ecological linkages are limited (connecting the Liesbeek to the Black River
- Improve Faunal connectivity by allowing access under or through the fences at Valkenberg Hospital.
- Removal and replacement of heavily contaminated topsoil.
- Rehabilitation of faunal habitats dependant on the removal of canalization of the two rivers and regarding the bank profiles.
- Reduction of Black River water volumes probably be beneficial, as it would then be closer to the original seasonal river system.
- Remove ageing steel wall barrier between the Raapenburg Bird Sanctuary and the Observatory.
- Control of Typha (bulrush) and Phragmites (reeds) in the permanently wet areas presents a major problem.
- Litter in both rivers is a significant issue for riverine and particularly marine fauna.
- Additional roosting, resting and hunting sites along the rivers will increase the attractiveness of the area to many bird species.
- There should be no spraying of herbicide along the banks of the rivers, as it can have negative impacts on the aquatic fauna.
- Faunal connectivity can also be improved by ensuring that any new roads have rounded instead of vertical kerbs.
- Creation of a partly vegetated breeding ponds away from the river will enhance the habitat value and breeding success for the Endangered Western Leopard Toad.

notes .....



River Corridor Management Plan

BIODIVERSITY INFORMANTS SUMMARY

Compiled by TKLA

KEY

0 100 250 500

TRUP Boundary

Critical Biodiversity Area Category:

- CBA 1d
- OESA
- Other Natural Vegetation

Sources: Biodiversity Network for CCT SANBI 2016

Botanical sensitivity

- High
- Medium

Faunal Sensitivity

- High
- Medium

Source: Helme N. 2016

East - West barriers

11.4. Open Space and Accessibility Informants

Status quo reveals a limited usable park area, attributed to limited access points, limited river edge recreational opportunities, infrastructural barriers, instituional land uses, limited public transport access and limited river crossing.

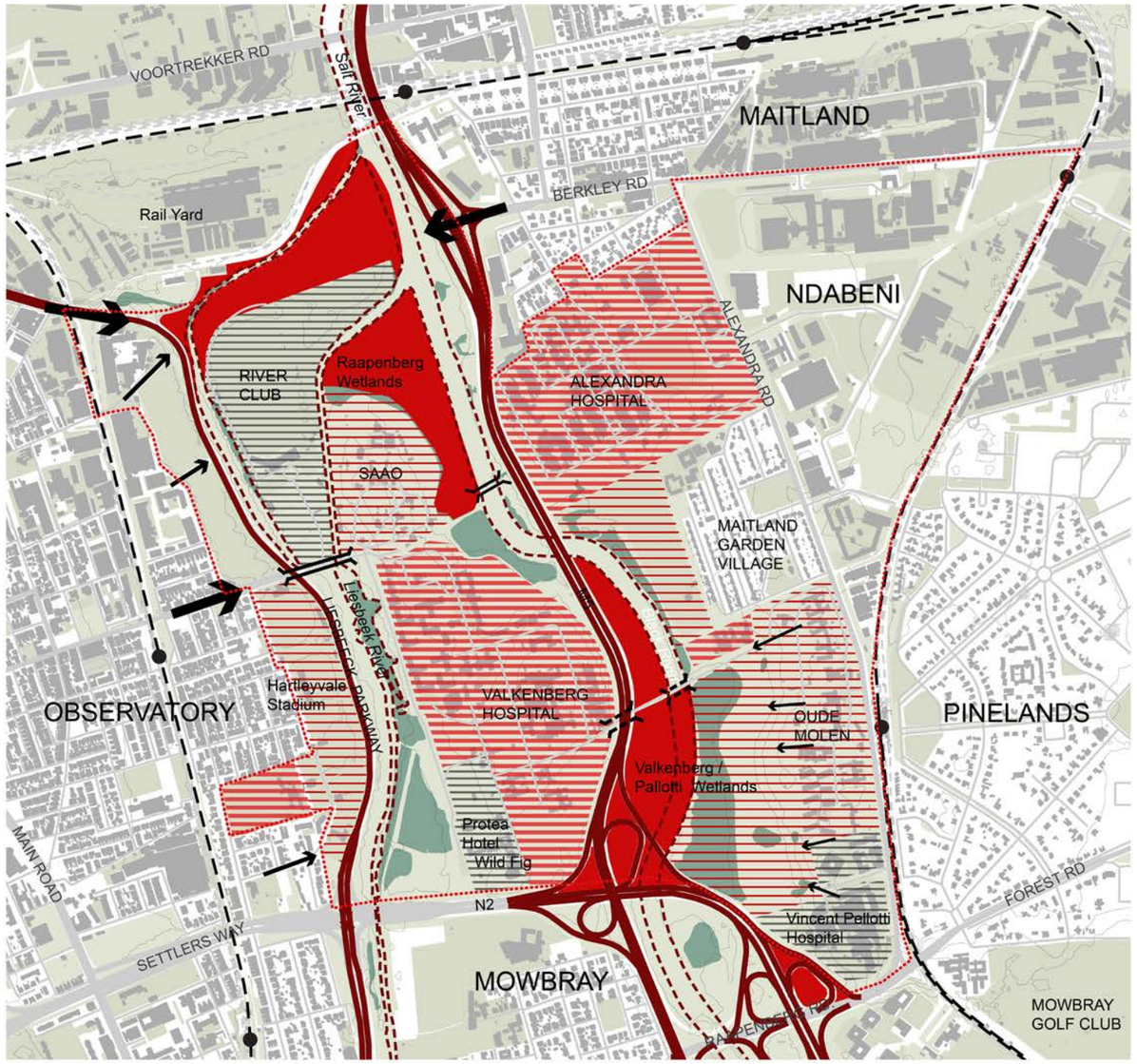
- The extent of easily accessible park is limited
- Limited passive recreation areas
- Select embankments function as recreational facilities
- Access to active recreation limited
- Access to rivers edge limited
- Variety of fragmented landscape typologies
- Need to address the divisive impact of the M5 and Liesbeek Parkway
- No NMT opportunity adjacent to Black River, linking into Langa to the east and Paarden Island to the North.
- Limited NMT opportunity adjacent to Liesbeek River
- No Public transport system within TRUP
- Currently limited access to/from bus services and the TRUP site
- The TRUP site is boxed in by the current configuration of the road and rail network
- The proposed connection, linking Berkley Way and Albert and Malta Rd may assist in reducing the current congestion on Liesbeek Parkway
- M5 upgrade omitted to reinstate Station Road Connection

notes .....

to the Black River Eastern bank.

11.5. Urban and Social Informants

- The Park system is not integrated into the adjacent urban development, it is either fenced off from development or disconnected due to infrastructural features.
- Lack of surveillance from adjacent development into the Park presents a safety risk.
- Public land is utilised for Park and Institutional facilities which presents the opportunity for possible connectivity across institutional precincts.
- The recreational and sporting land uses currently facilitate access into the Green Corridor Precinct, though they are currently disconnected from the Park and adjacent residential infrastructure and an integrated Public Transport system.
- There are currently no freely accessible public facilities and amenities within the Park apart from remnant public open spaces and practice fields adjacent to the Liesbeek River and on the East Banks of the Black River. As Hartley Vale and The Observatory have controlled entrances and Valkenberg Hospital and Alexandra Hospital are controlled Public Health Care Facilities. The swimming pool within Oude Molen is monitored by the Oude Molen precinct.
- The relocation of the Valkenberg Forensic Unit to the Valkenberg precinct presents an opportunity for locating a public facility as a catalyst for change into the Park.
- There are also no places of memorialisation or celebration within the Park, the First Nation's sites of memory and the convergence of the Black and Liesbeek Rivers present opportunities.
- As do the points of crossing the Rivers, as they could begin to address the Historic divisive nature.



River Corridor Management Plan

OPEN SPACE AND ACCESSIBILITY INFORMANTS SUMMARY

Compiled by TKLA

scale 1:5 000 at 60 x80 cm

0 100 250 500

KEY

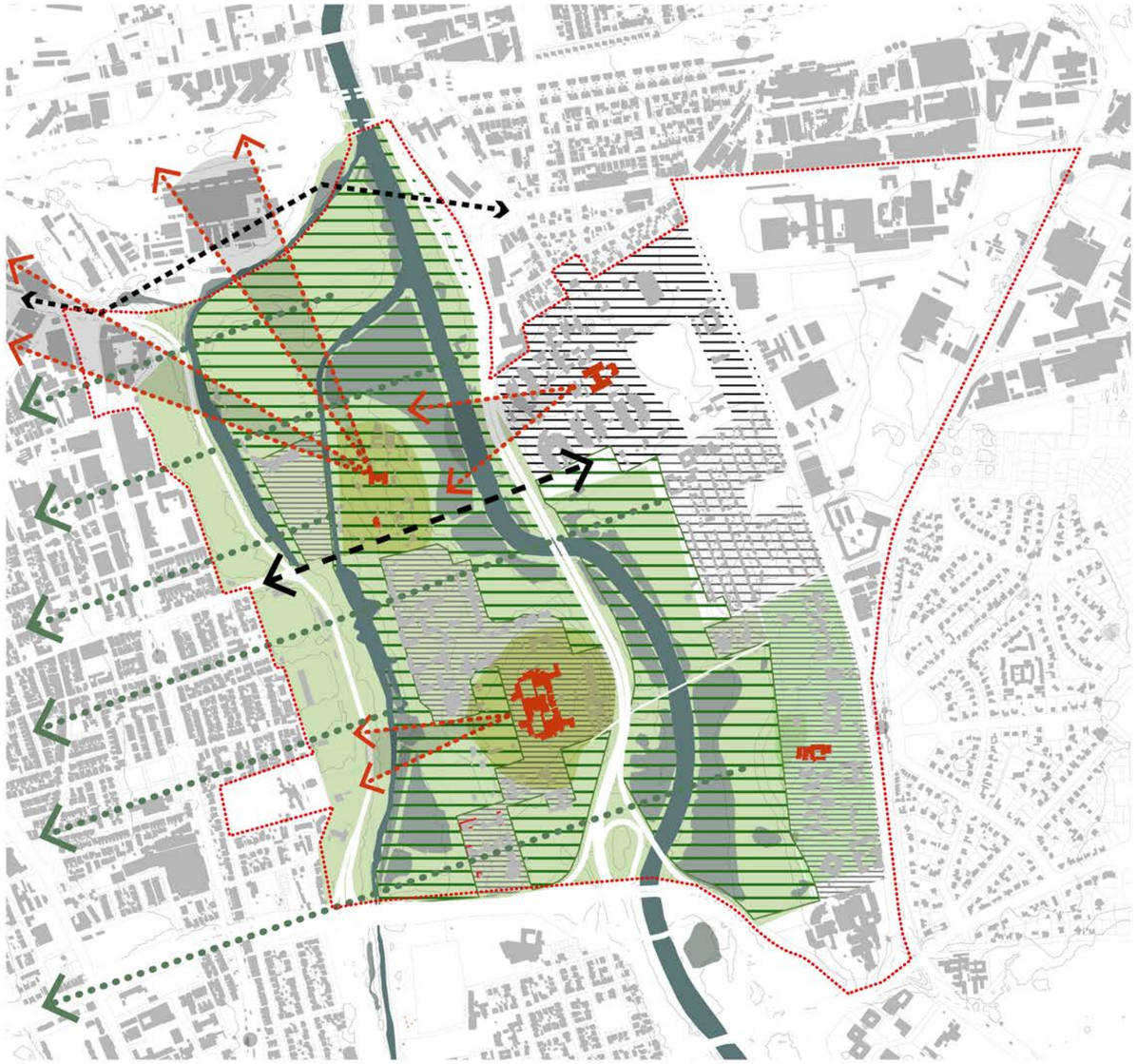
- TRUP Boundary
- Not Accessible
- Public Institution with Controlled Access
- Public Institution with Restricted Access
- Private Property
- Wetlands
- Road Barrier
- Steap River Edges as Barrier
- TRUP Boundary
- NMT free access river crossing
- NMT restricted access river crossing
- Access Points Road and Pedestrain
- Access Points only Pedestrian

11.6. Public Participation Informants

- Protects the integrity of the ecological systems - green lung.
- Enables and enhances bio-diversity corridors.
- Enables urban agriculture.
- Balances environmental and recreational uses.
- Enhances the perception and the experience of the landscape.
- Clean the water of the rivers through a broader water purification strategy.
- Protect the integrity of the ecological system.
- Enabling the wetlands.
- Naturalising the river courses [getting ride of concrete hard edges along the river].
- Survey and protect fauna and flora.
- Enabling recreational use of the rivers.
- Is a pedestrian and public transport based area [reduced car/no car].
- Promotes the use of public transport through an extensive and strategic IRT and NMT network.
- Provides strategic [NMT] pedestrian and cycle links and bridges [re-introduce the bridge over Black river].
- Mitigates the impact of infrastructural and natural barriers across the site.
- Is an open public amenity accessible to all.
- Has a wide variety of social infrastructure.
- Ensures the continued functioning of existing activities.
- Protects and enhances the heritage landmarks and views.
- Identifies spaces for ceremonies and rituals.
- Celebrates the diverse cultural narratives associated with the site.

- Extends to the sea and to Langa
- Includes the development of Alexandra Rd as an 'activity street'.
- Includes the MGV development strategy.
- With regard to the proposed future developments, such as the River Club, CHTP, SKA and Berkley extension, the stakeholders' response has been summaries as followed:
- The 130 000 m² development proposed by River Club is totally unacceptable.
- SKA could take place between Valkenberg and the Observatory.
- Berkley Road extension should take place, avoiding the green area as much as possible.

notes .....



12. Landscape Masterplan concepts

Conserve

‘Conservation is the sustainable use and management of natural resources including wildlife, water, air, and earth deposits. Natural resources may be renewable or non-renewable.’

Connect

“bring together or into contact so that a real or notional link is established.”

Activate

Make (something) active or operative

The primary conceptual informants guiding the GCCP are based on the three principles that emerged during the Status Quo analysis, they are the need to Conserve, Connect and Activate the Green Corridor in order to facilitate the creation of a sustainable active public park.

The strategic interventions that guide the GCMP

One of the primary interventions, which have the opportunity to unlock access to the site and link communities across the 'River Divide', is the extension of Station Road and bridging across the Black River and the M5 to connect to the East Bank of the Black River.

In terms of the Green Corridor this will facilitate access across and through the Park between currently divided communities, as well as enable a connectivity within the park for ecological, NMT and public transport access.

The location of community amenities/ facilities at key access points(some of heritage value) in combination with activated urban/residential/medium density development on the edges of the Park creates opportunities to re-dress the socio-spatial legacy of apartheid.

The insertion of places of celebration provides opportunities for the different cultural narratives that are present within and around TRUP and assist to design the Park as a truly shared open space and a new metropolitan destination

The conservation and rehabilitation of the water systems and their related habitats will improve the ecological integrity of the Park and provide recreation, education and economic opportunities.

The water management systems make provision for water flooding, water cleansing and water storage in order to enhance the recreational quality and environmental value of the site.

Consideration of the zoning, servitude and restrictive conditions of title in accordance with the proposals contained in the GCCP and the LMP will be required in order to facilitate the proposals.

The area which is the subject of the biodiversity agreement between Conservation Board, be configured to align with the contextual information contained in this report as well as the purposals made in the GCCP and the LMP.

12.1. Hydrological and Biodiversity Concept

Conserve, existing river systems, wetlands and biodiversity linkages:

Improve and rehabilitate through the removal of canalisation, introduction of habitat friendly stepped embankments.

Construction of storm water amelioration systems that filter and detain storm water before it enters the river systems

Introduction of flood amelioration areas/ ponds that provide storm water detention as well as create additional seasonal wetlands.

Develop outside of the 50 and 100 year floodlines.

Connect, via green fingers and constructed storm water swale.

The surrounding development areas to the riperian zone storm water systems as active positive environment

Facilitate positive NMT access into the wetlands and along the rivers edges

Construct bird island habitats in the river system Liesbeek and Black River corridors through 'green fingers'

Activate, the water's edge through providing amenities,

Board walks, Bird hides,

Proposed docking station for small canoes

notes .....

River Corridor Management Plan

HYDROLOGICAL AND BIODIVERSITY CONCEPT

Compiled by TKLA

KEY

0 100 250 500

- TRUP Boundary
- Stormwater Inlet
- 100 Year Flood Line
- Stormwater Detention and Treatment
- Flood Storrage Areas
- Other Open Space
- Wetlands
- Main Rehabilitation Areas
- Bridge
- Biodiversity Linkeages - Green Bridge
- Biodiversity Linkeages Thrugh Fences
- Biodiversity Linkeages - stepped embankements
- Biodiversity Corridors
- Docking station
- Bird Hide
- Proposed Development
- Long-term Proposed Development
- Development Private Land

12.2. Active and passive Open Space Concept

Conserve the variety of landscape typologies and habitats that exist within the Park that provide active and passive open spaces The wetlands for both their ecological and heritage value

The open grass meadows

The Historic Sports precinct , Hartley Vale and the practice fields.

Visual connections to and from the Heritage precincts situated on the elevated ridges

Urban Agriculture as historical use of the landscape

Connect the variety of open spaces within the Park,

via an activated NMT route

through a network of board walks and path ways that enable access to the ecologically sensitive zones within the Park

Activate through the provision of a network of active and passive recreation zones within the Park

Provide for a place of public gathering and celebration

Develop the Sporting precinct

Include childrens play areas

Develop board walks and bird hides

Provide cycle and horse routes

Provide look out points

notes .....

River Corridor Management Plan

OPEN SPACE CONCEPT

Compiled by TKLA

KEY

0 100 250 500

- TRUP Boundary
- Sportfields
- Medow and Grassy Embankments
- Active Recreation Areas
- Main Green Connections
- Other Open Space
- Wetlands
- Agriculture
- Green Bridge
- Institutional Gardens
- Main conntact zones with water bodies
- Main open space connections with the surrounding
- Docking station
- Cultural and Social Key Destinations
- Heritage Structures

12.3. Accessibility Concept

Conserve the park as both a destination and a link between the western and eastern TRUP precincts and as a threshold between the north and south Metrapole.

Provision of additional NMT and PT linkages, extension of Station Road across the M5 extension of Berkley Road

Connect the surrounding communities into the Park via a series of gate way thresholds, that link into both a commuter and recreational NMT network

Provide bridges and stepping stone routes across the rivers for ease of access

Activate the park edges through clustering activities along the NMT routes.

Cluster facilities and amenities at entrance thresholds.

Locate recreational zones (play, seating etc) along primary NMT routes.

notes .....

River Corridor Management Plan

ACCESSIBILITY CONCEPT

Compiled by TKLA

KEY

scale 1:5 000 at 60 x 80 cm

0 100 250 500

- TRUP Boundary
- Proposed Development
- Long-term Proposed Development
- Development Private Land
- Green Corridor
- Wetlands
- Bridge
- Green Bridge
- PRT
- NMT
- Pedestrian
- River Crossing (Boardwalk)
- River Crossing (Stepping Stones)
- Main Access Points

12.4. Edge Concept

Conserve the historical alignment of the built edge to the Park .

Celebrate the transition zones between heritage precincts and the Park.

Respect view lines and visual connections.

Connect adjacent urban development into the Park through the location of active edges along the park boundary.

Placement of public amenities and facilities on the edge of the park.

Clustering public buildings at the gate way thresholds.

Activate the park edges and contribute to the safety of the park.

Location of a system of active public facilities/ amenities linked to a community infrastructure promoting safety within the park.

Enable a variety of building typologies along the park edges.

notes

River Corridor Management Plan

EDGE CONCEPT

Compiled by TKLA

KEY

0 100 250 500

- TRUP Boundary
- Active edge
- Proposed Development
- Long-term Proposed Development
- Development Private Land
- Green Corridor
- Wetlands
- Bridge
- Green Bridge
- Heritage Structures

12.5. Landscape Masterplan

The intervention proposed is informed by 3 Strategies:

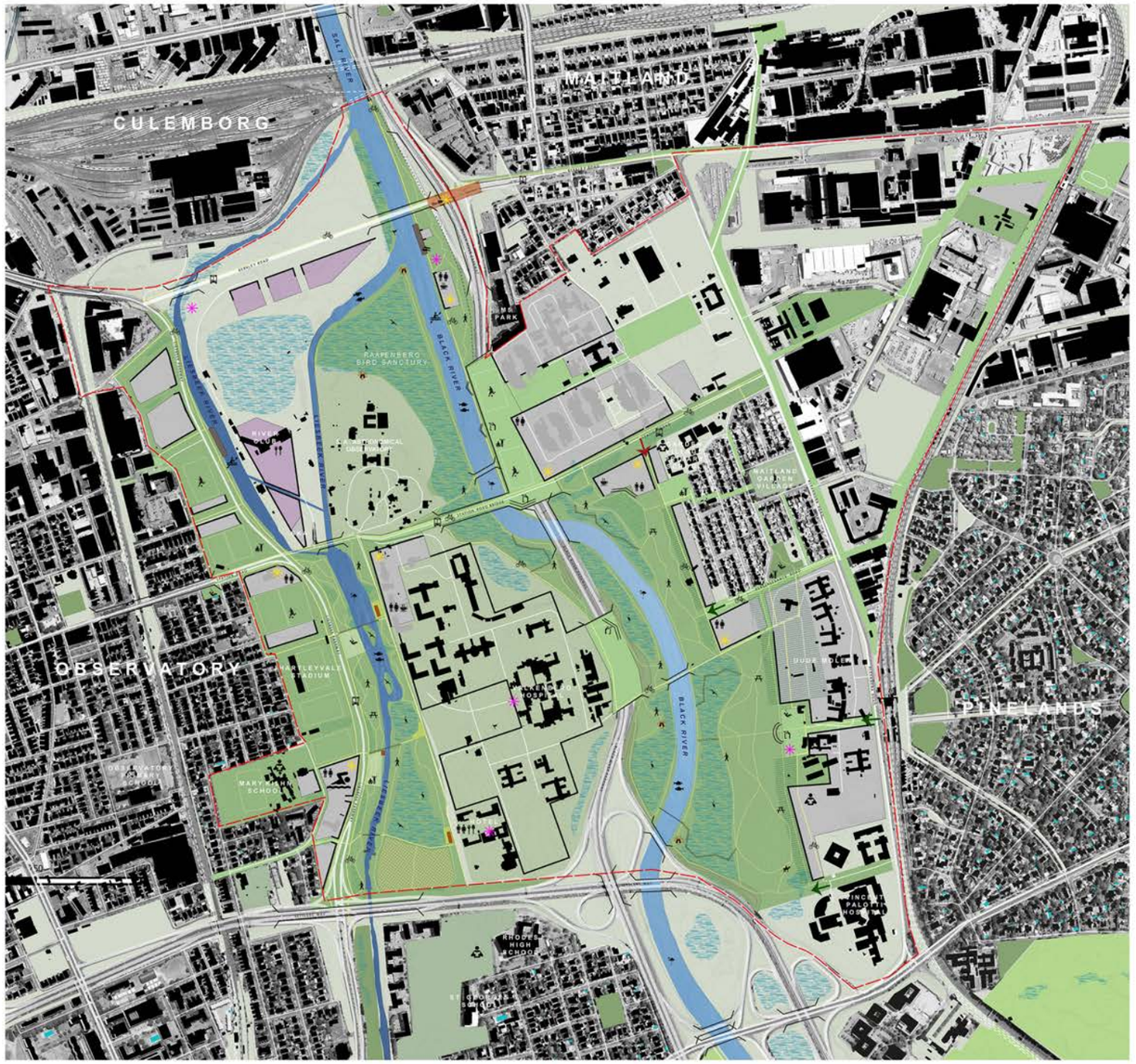
1 Conservation , rehabilitation and active engagement with the Biodiversity and Heritage elements within the corridor. With the development of these areas as destination points, visual landscapes and/or activity zones.

2 Accessibility within the corridor and for communities from outside the GC for the purpose of enabling natural system's connections and social cohesion across TRUP.

3 Activation of the gateway nodes into the GC and along the thresholds between development areas and the Park, with the insertion of public facilities and amenities (the idea of the 'Mills of Culture') spread throughout the GC.

A central objective in establishing the Park is the need to define and activate the edges. This is essential to address the issues of security and surveillance without relying on fencing, supplying large numbers of security personnel or sophisticated monitoring systems.

notes .....



LANDSCAPE MASTERPLAN

Compiled by TKLA

scale 1:2 000 at 1500 x 1999 cm

0 100 250 500

KEY

- TRUP site
- Proposed Buildable Areas with Active Edge
- Development on Private Land
- Wetland
- Stormwater Detention
- Urban Agriculture (Vegetable and Herb Gardens)
- Urban Agriculture (Orchard)
- Open Space Active Recreation Areas
- Green Open Spaces, Passive Recreation
- Playgrond
- Sportfield
- Green Bridge
- Public Buildings Key Destination
- Cultural Destinations
- Bird Hide
- Docking Station
- Bridge
- River crossing stones
- Boardwalks
- Viewing points
- Pedestrian path
- NMT
- Public Toilets

12.6. The proposed interventions between Station Road and the N2

The consolidation of the sporting facilities south of StationRoad into a regionally significant sporting precinct accommodating:

- Hartleyvale stadium with additional practise fields;
- The swimming pool and potential expansion thereof, where necessary;
- Fields for soccer clubs and Mary Kihn School for the deaf.

Small pockets of mixed use development are proposed as a means to activate the precinct beyond the hours of sporting events and may include student housing. Parking is proposed to be handled remotely but drop-off zones and bus parking will be considered within the precinct.

Reclaim the road and parking areas between Station Road intersection and the N2, for storm water filtering and detention as well as passive recreation purposes through:

- Application of sustainable urban drainage principles
- Grassed park areas interspersed with seasonal wetland areas that can be mowed in summer and used for active recreation
- Removal of parking areas along the river's edge will enable more active direct contact with the park, by the adjacent community.
- Future down scaling of Liesbeek Parkway from a commuter route (when Berkley Road connection is built) into a local public transport and NMT route, will enable ease of access across Liesbeek Parkway and encourage increased recreational use of the river's edge.

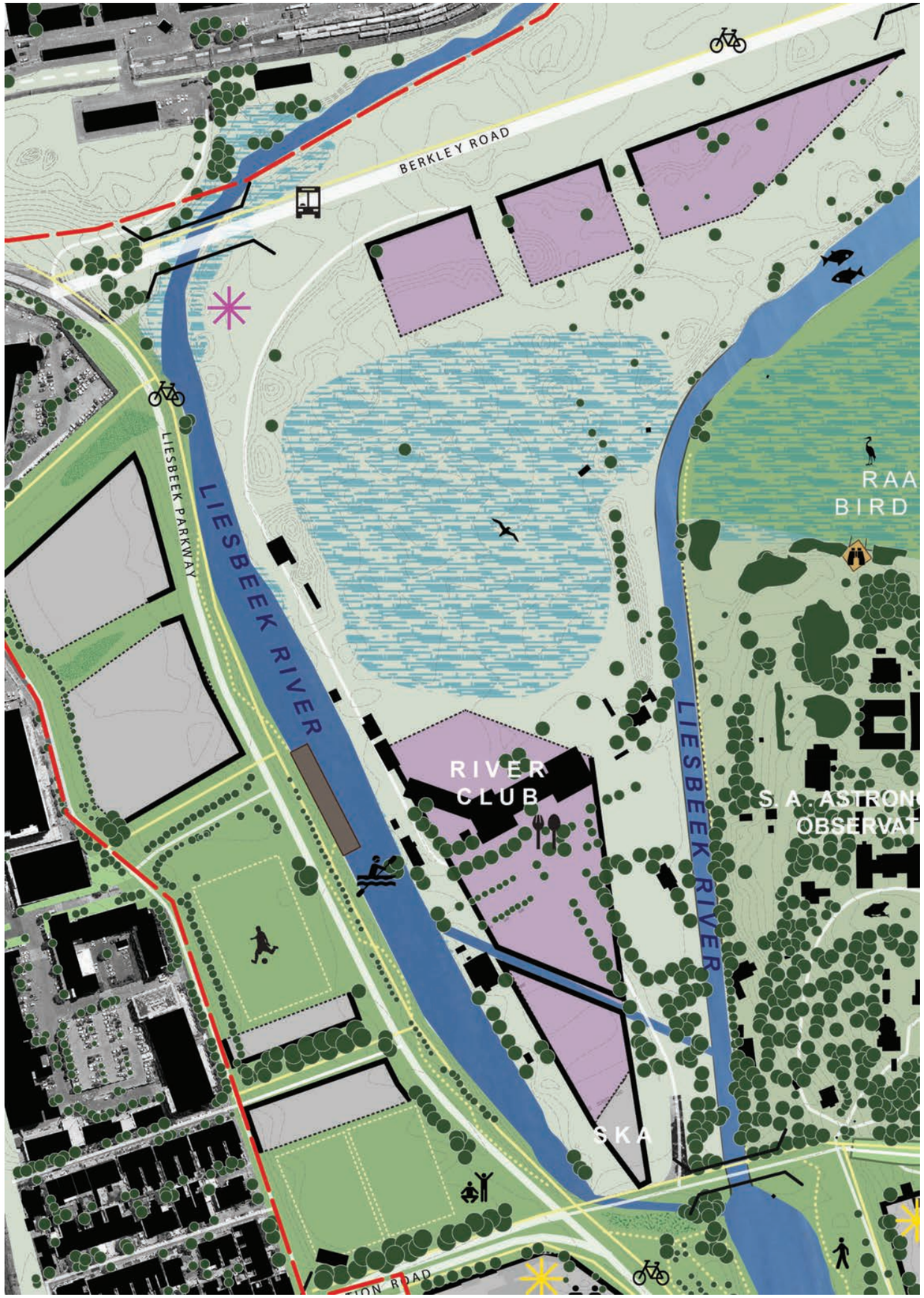
Enhance accessibility and connectivity of the Liesbeek River through:

- The construction of two additional foot bridges and pedestrian paths through Hartleyvale precinct, allowing it to become an extension of the front yards of the Observatory houses.
- Offering opportunities for families and visitors to enjoy the waters' edge.
- Additional pedestrian bridges and stepping stone crossings across the Liesbeek River connecting the East and West Banks, enabling direct access from Valkenberg Hospital and the Wild Fig Precinct to Liesbeek Parkway and Observatory.

Increasing habitat diversity and creating Fauna friendly river embankments through:

- Altering the profile of the Liesbeek River embankments to stepped or gradually sloped profiles, that enable fauna to enter and exit the river system as well as facilitate pockets of seasonal wetland habitat along the edges of the river.

notes



12.7. North of Station Road up until the proposed Berkley Road extension

Reinstatement of Liesbeek River Historic arm and the canal between River Club and the Observatory as a natural riverine systems, through:

- Removal of concrete lining to the river
- Reinstatement of stepped embankments and planted wetland edges
- Retention of the two Southern fields as sports precincts overlooked by proposed residential and mixed use development, enabling constant surveillance of the open space and activation of the edges.
- Retention of tree lines that demarcate Historic farm boundaries.
- Introduction of 'green fingers' that support a system of drainage swales that ameliorate the storm water discharge into the river and reduce localised flooding due to the storm water discharge**.**

The redevelopment of the sports fields on Malta Road for a mix of uses including some structured parking above ground floor and small practise sports fields for community and local club use. The mix of uses should include offices and residential with more active occupancy facing onto the fields and Liesbeek Parkway

The part development of portions of the River Club in a manner which does not impact on the hydrological, ecological and cultural role of the confluence area into the future. Development on this private land parcel is expected to be mixed use with residential, destination based retail and offices creating an edge to a centralised green open space / wetland area. The Concept requires that this parcel accommodates a public destination that relates to the green open space component. The public destination could include possibilities of an events venue, environmental education centre, cultural centres etc. The edges of the proposed development to be active at ground level to provide interest and surveillance over the public open space component.

- Proposed seasonal flood attenuation wetland, located within the zone of the sensitive view cone emanating from Observatory Hill.

The flood attenuation pond will assist in alleviating flooding (1:100 flood)

notes

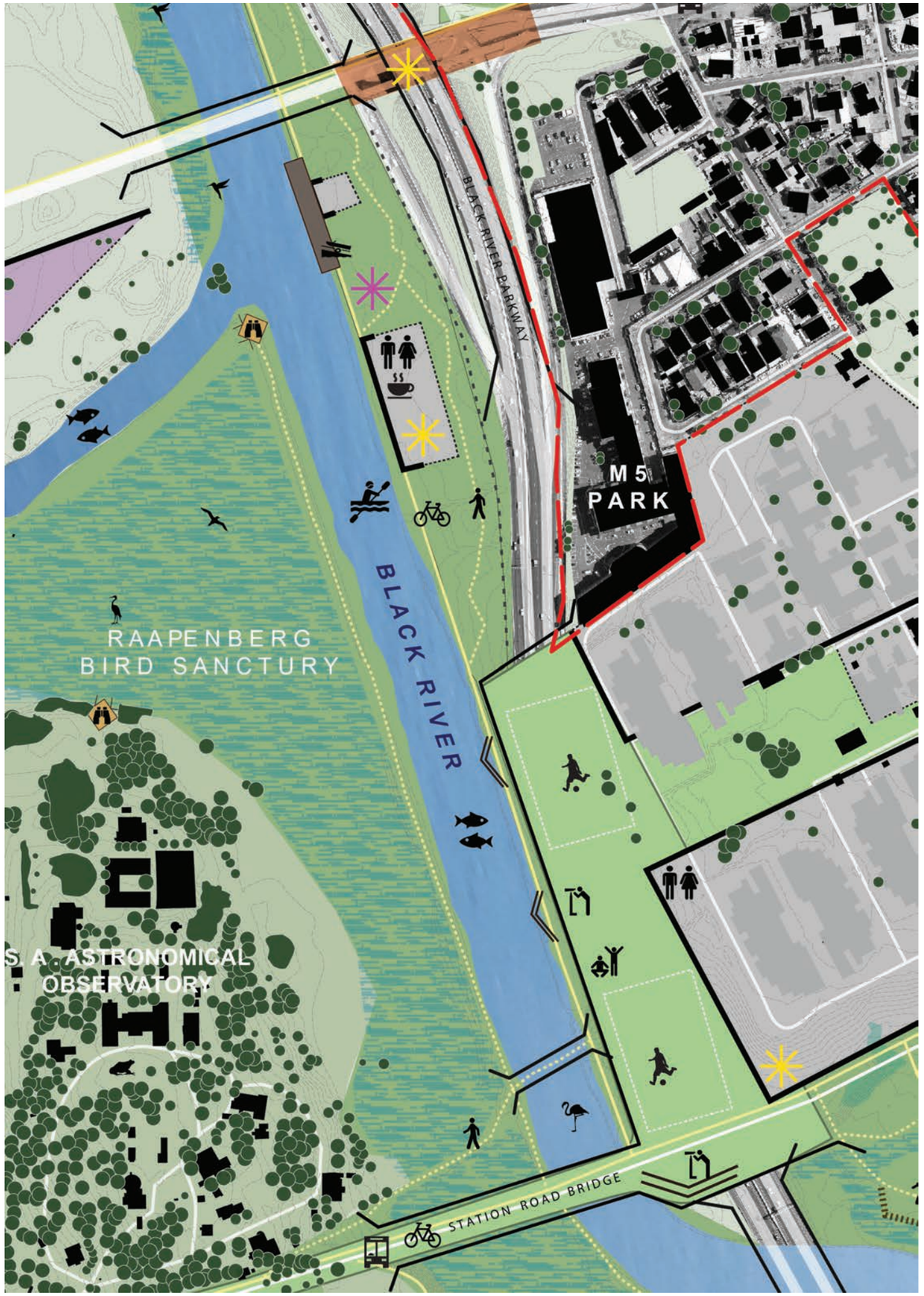
12.8. Alexandra Hospital Green Corridor Precinct

The proposed LMP extends the Alexandra precinct across the M5, in order to cover the M5 and create opportunities for public amenities and access routes along this edge. The raised promontory affords magnificent views across the Raapenberg Wetlands, the confluence of the two rivers and views of Table Mountain and Devils Peak. The Old Mill and the green zone as identified in the Heritage report, is one of the main focus points of this precinct.

The development edge facing onto the platform and facing the south onto the new Station Road Extension should accommodate public facilities, and hospitality activities which encourage residents and visitors to dwell within the area, support commuters using the PT services on the Station Road extension as well as users of the NMT route along the Black River edge.

The creation of a docking feature on the edge of the Black River just south of the M5 / Berkley Road intersection. This proposal is expanded on in the Specialists Study: Watercourse Management Plan and docking feature, but in summary comprises a facility which allows small paddle craft to launch onto the Black River. This docking site is proposed to be supported by a manned Information Centre with exhibition / museum space and a small events venue, cafes, bike parking and toilets. The Information Centre is necessary to orientate visitors in relation to the bigger TRUP site and inform them of the significance / history of the locale and in particular the confluence of the rivers, as the site of pre-colonial habitation and the site of a colonial frontier. The Prestwich Memorial and Visitors Centre in the City Bowl is an example of the type of facility being considered. The site offers dramatic views over the wetland areas towards Devils Peak and Signal Hill and as such is the perfect place for viewing decks and cafes that provide interest and vibrancy and surveillance over the site. The site will be located on an important NMT route connecting TRUP with Voortrekker Road in the short term and the CBD in the longer term.

notes



12.9. Maitland Garden Village Green Corridor Precinct

The threshold between the Black River and Maitland Garden Village is narrower than that experienced at Oude Molen, with a reduced wetland system and sloping grass embankments that connect the Village down to the Rivers edge. The Heritage informants advocate interventions sensitive to the Heritage status of Maitland Garden Village within the threshold zone between the Village and the Park. The landscape interventions propose the establishment of an extended floodplain with wetlands that can be used for passive recreation in summer and flood attenuation in winter.

Development within the threshold zone, emphasis on community requirements with the potential for multiple uses by the public.

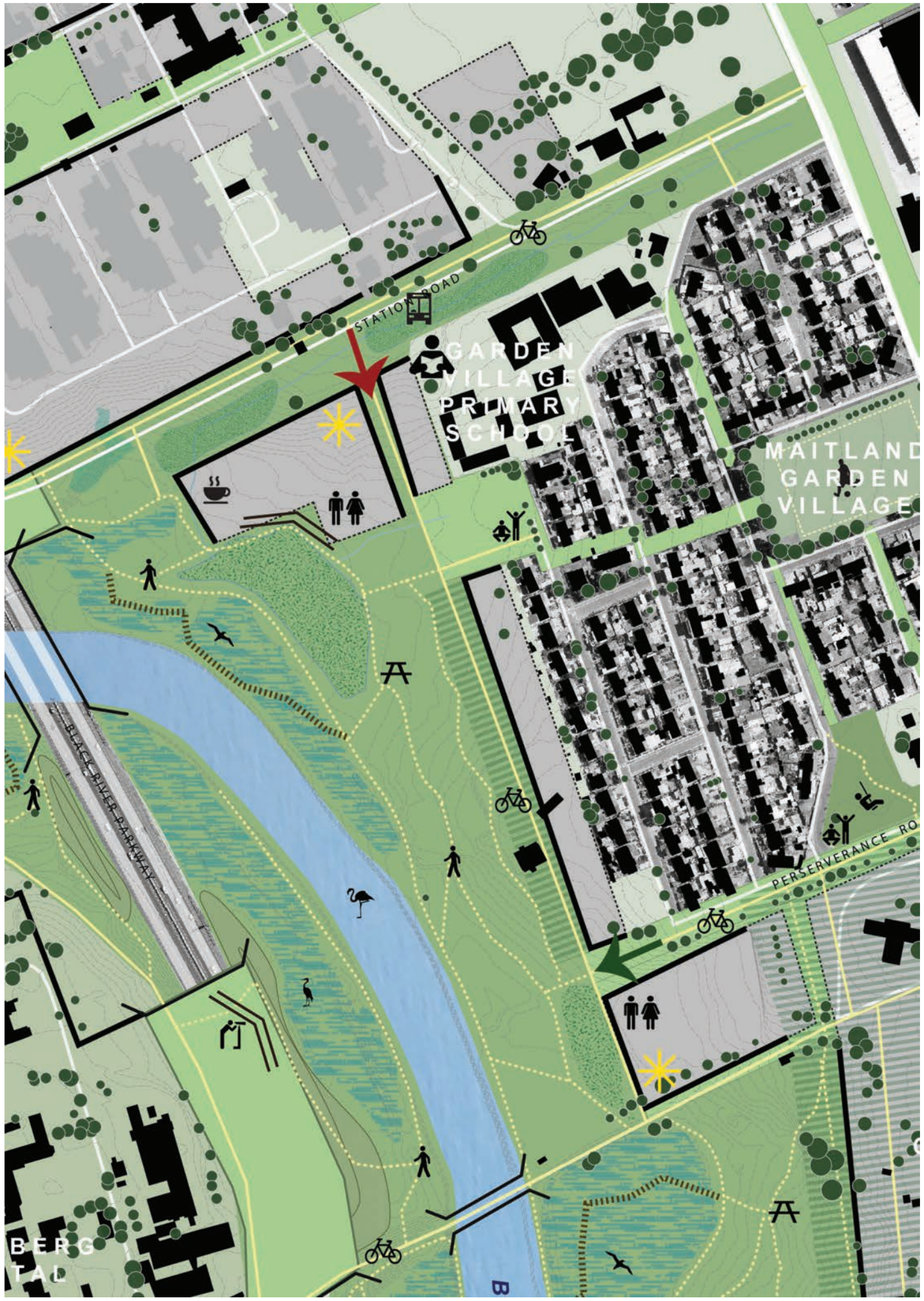
- Provide structured children's playgrounds and kick-about spaces to service the needs of a resident community.

Small areas earmarked for development will accommodate public facilities and residential to put eyes over the space, and provide passive surveillance.

Continuation of the North South NMT route.

- The footprint indicated adjacent to the proposed Station Road extension is located strategically and will be more accessible in the long term once public transport services start to operate across the Park. It is therefore recommended that the building be developed as one or a combination of the following: museum, events venue, exhibition space, special school. Regardless of what it contains, it needs to support the public space in front of it by accommodating toilets and other essential public facilities and elements.

notes



12.10. Oude Molen Green Corridor Precinct

The consolidation of the green open slopes in front of Oude Molen as the historic green open space foreground to the Oude Molen development, through:

- a mix of urban agriculture, passive recreational opportunities and conservation, the latter to be made accessible to the general public through a network of board walks and pathways, linking down into the wetlands and onto the NMT network link into the City
- a proposed built edge on the Oude Molen Precinct that provides passive surveillance overlooking the wetlands towards the mountain .
- the development of an active NMT route adjacent to the Oude Molen precinct, supporting additional play, gym, seating and recreation areas, that both provide a public interface to the Park as well as facilities for the adjacent residences.
- a gradation in activity and formalised to informal landscape zones as the landscape descends down the slope towards the Black River wetlands and river's edge. Simultaneously moving from a frequently managed landscape zone to a less frequently managed landscape area.
- The retention and celebration of the Historic View Cone from the Old Mill site, as a prominent site from which to view the Black River corridor across to Valkenberg and Table Mountain, and as a location for the development of public facilities and amenities. As one of the ' Mills of Culture'. Regardless of what it contains, it needs to support the public space in front of it by accommodating toilets and other essential public facilities and elements.
- Reuse of the Valkenberg Forensics Unit as a cultural amenity/museum/cultural events space, located within the Park as a unique public infrastructure that provides a facility of Metropolitan value.
- Proposed planted earth berms constructed along the M5, as visual screening of the M5 from the wetland, in order to obscure the moving traffic from view whilst experiencing the wetland environment. (careful surveying of proposed berm areas required in order to ensure they do not effect sensitive wetland habitat)

Gateway thresholds as opportunity for clustering Public and Private facilities and encourage active use of the Park.

- Alexandra Road gateway is also expected to accommodate the new Cape Health Technology Park (CHTP) Phase 1 development which will provide added interest to the Park as a place of scientific research.

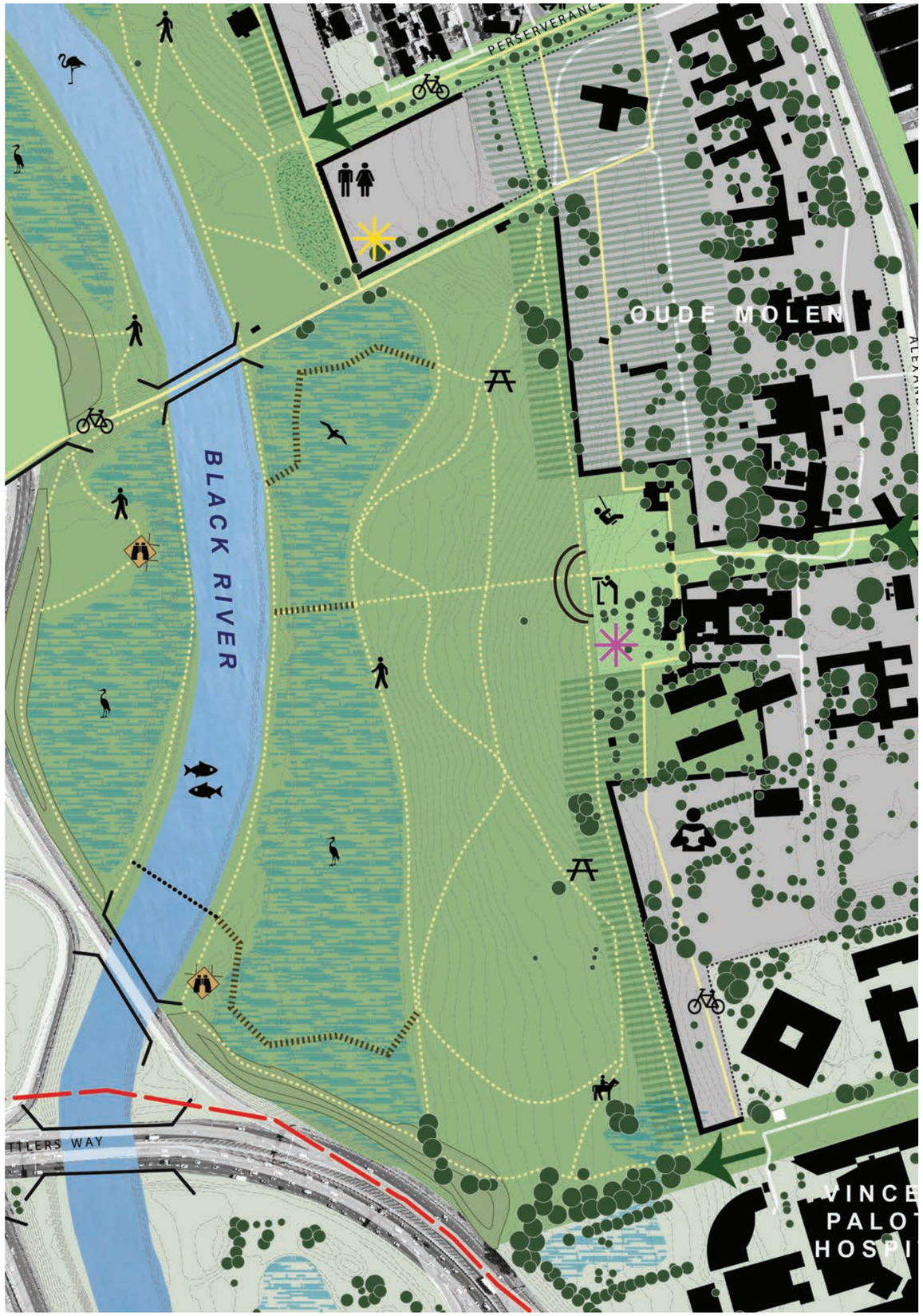
Enhance accessibility and connectivity of the Black River through:

- Construction of board walks into the wetlands and stepping stone crossings across the Black River connecting the East and West River embankments ,enabling direct access to bird hides and board walks within the wetlands. For recreational and educational purposes.across the Liesbeek River connecting the East and West Banks, enabling direct access from Valkenberg Hospital and the Wild Fig Precinct to Liesbeek Parkway and Observatory.

Increasing habitat diversity and creating Fauna friendly river embankments through:

- Altering the profile of the Black River embankments to stepped or gradually sloped profiles, that enable fauna to enter and exit the river system as well as facilitate pockets of seasonal wetland habitat along the edges of the river.
- Insert tree trunks and logs along the river's edge , to provide safe perching opportunities for Birds.

notes .....



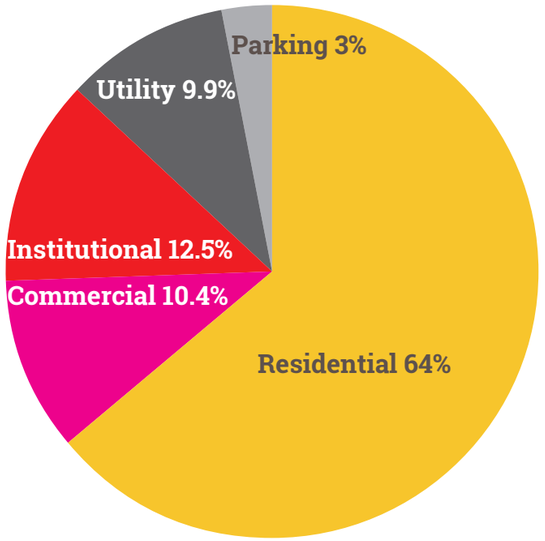
In order to conduct the Engineering Service Model, a concept design was required. This concept explores a possible maximum bulk.

High Level estimates based on what is defined in Concept as buildable areas and a breakdown of the desired land use types:

Additional population:

approx 43 000 people

Total floor area: 2 034 580 m2



Residential: 1 302 665 m2

Residential density:
35 - 190du/ha

Buildings' height: 2-7 storeys

Commercial: 212 512 m2

Institutional: 254 244 m2

Utility: 201 600 m2

Parking: 63 560 m2

Schools required:

6-8 primary schools

3 high schools

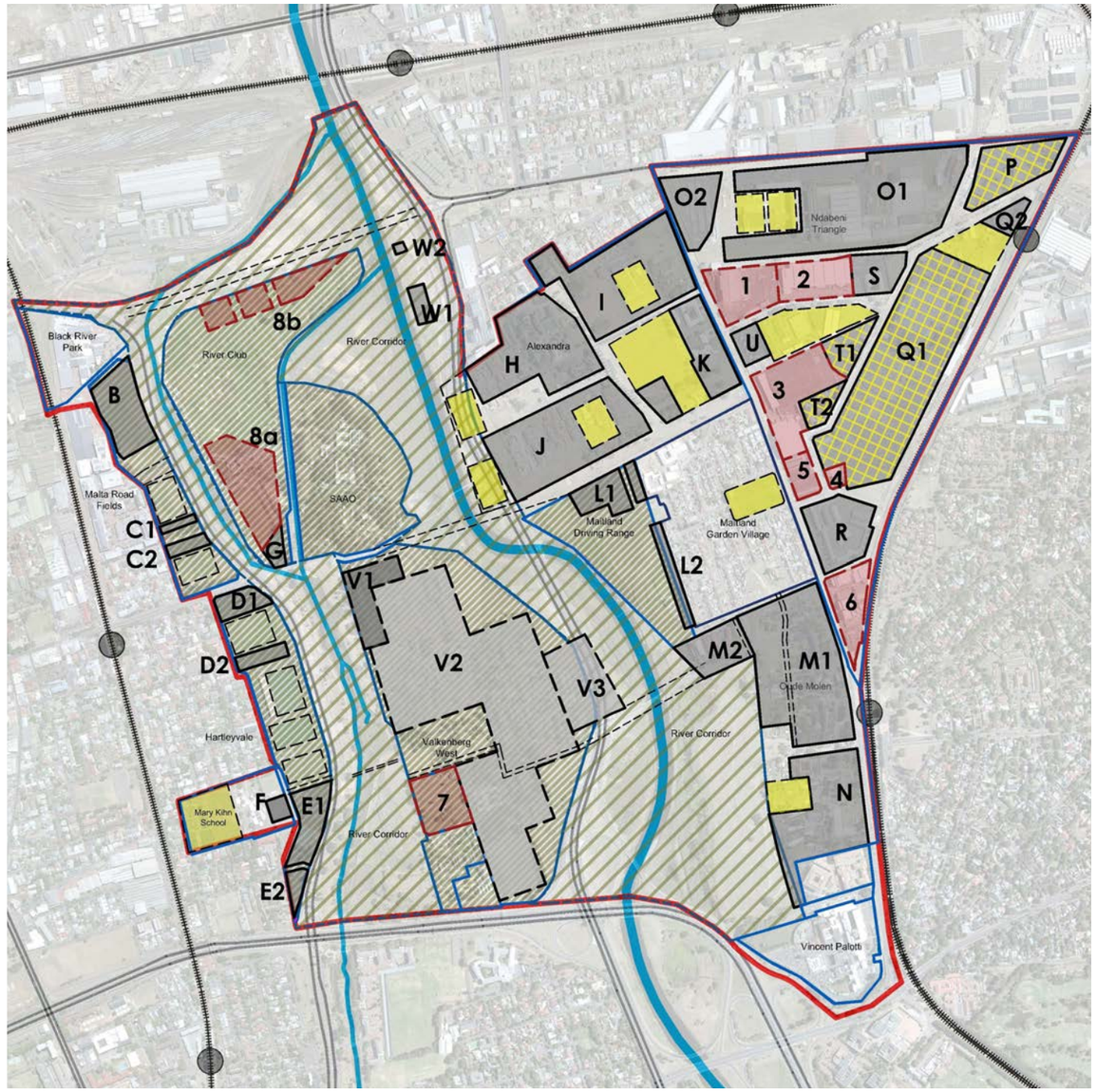
Approx. 13 ha in Ndabeni Triangle proposed to be retained for Consolidation of CoCT Depos

Implications for form and location of particular land uses:

- Public and commercial land uses on ground floor are essential to improve performance of the Park as a vibrant and safe space for all ages
- Parking to be located on the periphery as far as possible but also needs to serve major destinations such as Hartleyvale Stadium
- Parking floor area can be converted in time to other land use

residential property market demand segmentation

type	%	unit size m^2	no. of units
social	20%	40	4 841
affordable	24%	58	4 007
student	6%	20	2 905
market	50%	80	6 052
total	100%		17 805



BUILDABLE AREAS
SCENARIO 7 : Part Amended
Compiled by: NMA

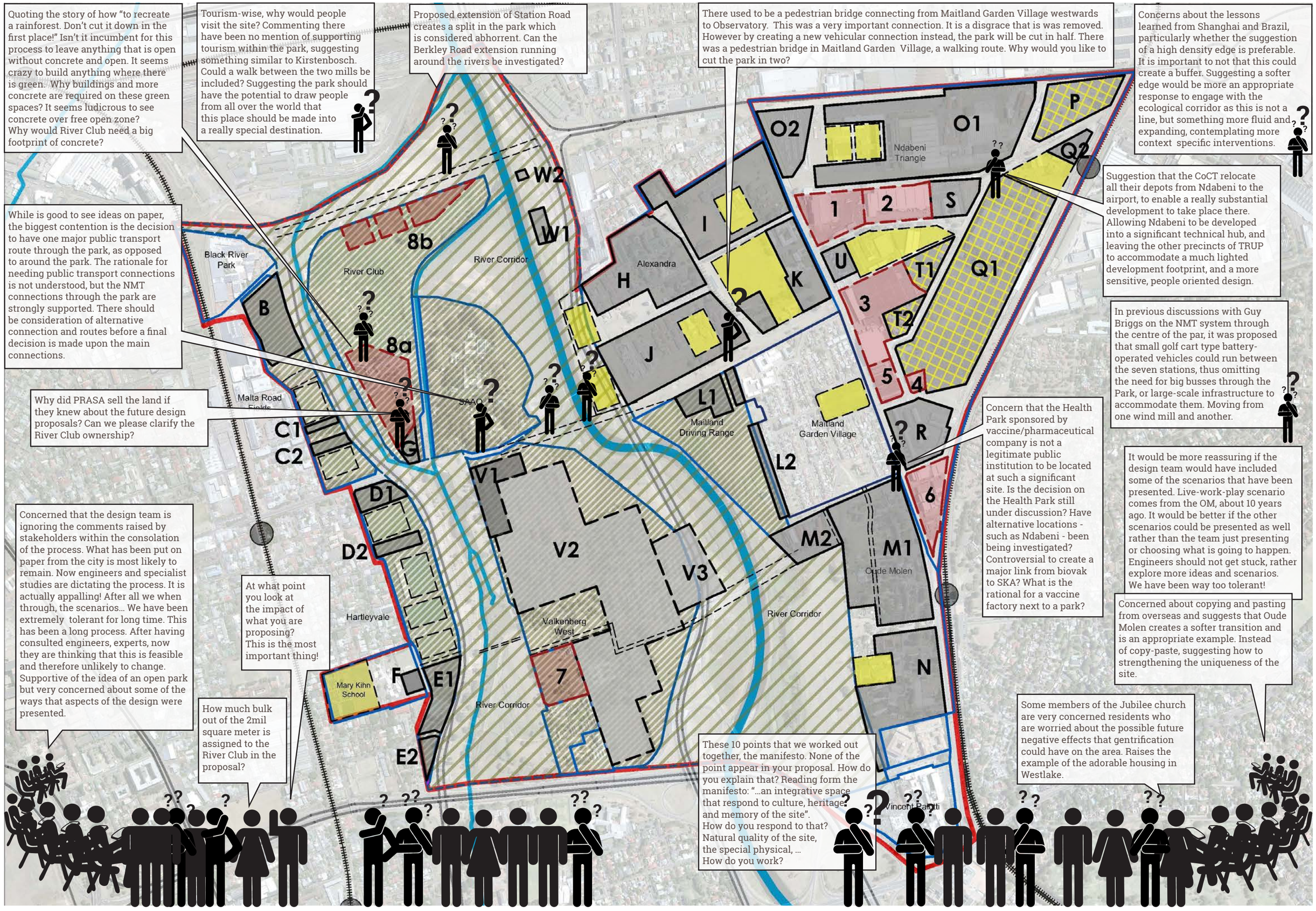
scale 1:10 000 @ A3

KEY

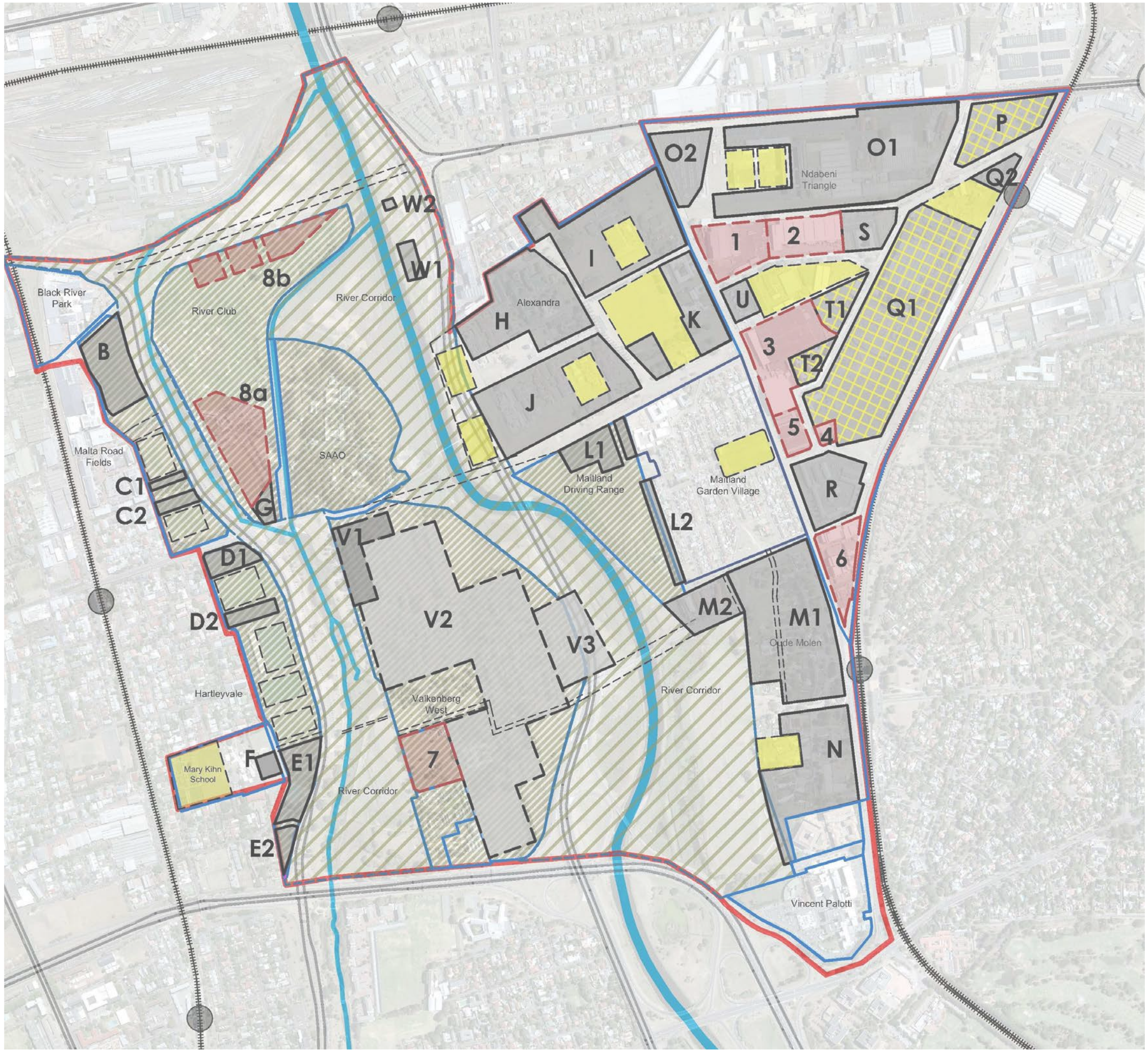
- TRUP Boundary
- Precinct Boundaries
- Developable Public Land
- Developable Private Land
- Proposed Green Areas
- Existing Sports Fields
- CoCT Depos
- River Corridor & Sub Precincts

NM & Associates Project Team

TWO RIVERS URBAN PARK


Quoting the story of how "to recreate a rainforest. Don't cut it down in the first place!" Isn't it incumbent for this process to leave anything that is open without concrete and open. It seems crazy to build anything where there is green. Why buildings and more concrete are required on these green spaces? It seems ludicrous to see concrete over free open zone? Why would River Club need a big footprint of concrete?
Tourism-wise, why would people visit the site? Commenting there have been no mention of supporting tourism within the park, suggesting something similar to Kirstenbosch. Could a walk between the two mills be included? Suggesting the park should have the potential to draw people from all over the world that this place should be made into a really special destination.
Proposed extension of Station Road creates a split in the park which is considered abhorrent. Can the Berkley Road extension running around the rivers be investigated?
There used to be a pedestrian bridge connecting from Maitland Garden Village westwards to Observatory. This was a very important connection. It is a disgrace that is was removed. However by creating a new vehicular connection instead, the park will be cut in half. There was a pedestrian bridge in Maitland Garden Village, a walking route. Why would you like to cut the park in two?
Concerns about the lessons learned from Shanghai and Brazil, particularly whether the suggestion of a high density edge is preferable. It is important to not that this could create a buffer. Suggesting a softer edge would be more an appropriate response to engage with the ecological corridor as this is not a line, but something more fluid and expanding, contemplating more context specific interventions.
Suggestion that the CoCT relocate all their depots from Ndabeni to the airport, to enable a really substantial development to take place there. Allowing Ndabeni to be developed into a significant technical hub, and leaving the other precincts of TRUP to accommodate a much lighted development footprint, and a more sensitive, people oriented design.
While is good to see ideas on paper, the biggest contention is the decision to have one major public transport route through the park, as opposed to around the park. The rationale for needing public transport connections is not understood, but the NMT connections through the park are strongly supported. There should be consideration of alternative connection and routes before a final decision is made upon the main connections.
In previous discussions with Guy Briggs on the NMT system through the centre of the par, it was proposed that small golf cart type battery-operated vehicles could run between the seven stations, thus omitting the need for big busses through the Park, or large-scale infrastructure to accommodate them. Moving from one wind mill and another.
Why did PRASA sell the land if they knew about the future design proposals? Can we please clarify the River Club ownership?
Concern that the Health Park sponsored by vaccine/pharmaceutical company is not a legitimate public institution to be located at such a significant site. Is the decision on the Health Park still under discussion? Have alternative locations - such as Ndabeni - been being investigated? Controversial to create a major link from biovak to SKA? What is the rational for a vaccine factory next to a park?
It would be more reassuring if the design team would have included some of the scenarios that have been presented. Live-work-play scenario comes from the OM, about 10 years ago. It would be better if the other scenarios could be presented as well rather than the team just presenting or choosing what is going to happen. Engineers should not get stuck, rather explore more ideas and scenarios. We have been way too tolerant!
Concerned that the design team is ignoring the comments raised by stakeholders within the consolation of the process. What has been put on paper from the city is most likely to remain. Now engineers and specialist studies are dictating the process. It is actually appalling! After all we when through, the scenarios... We have been extremely tolerant for long time. This has been a long process. After having consulted engineers, experts, now they are thinking that this is feasible and therefore unlikely to change. Supportive of the idea of an open park but very concerned about some of the ways that aspects of the design were presented.
At what point you look at the impact of what you are proposing? This is the most important thing!
How much bulk out of the 2mil square meter is assigned to the River Club in the proposal?
Concerned about copying and pasting from overseas and suggests that Oude Molen creates a softer transition and is an appropriate example. Instead of copy-paste, suggesting how to strengthening the uniqueness of the site.
Some members of the Jubilee church are very concerned residents who are worried about the possible future negative effects that gentrification could have on the area. Raises the example of the adorable housing in Westlake.
These 10 points that we worked out together, the manifesto. None of the point appear in your proposal. How do you explain that? Reading form the manifesto: "...an integrative space that respond to culture, heritage and memory of the site". How do you respond to that? Natural quality of the site, the special physical, ... How do you work?
Black River Park
River Club
River Corridor
Alexandra
Ndabeni Triangle
Malta Road Fields
SAAO
Maitland Driving Range
Maitland Garden Village
Hartleyvale
Valkenberg West
Oude Molen
Mary Kihn School
Vincent Pallotti
W2
W1
8b
8a
B
H
I
J
K
O2
O1
P
Q2
Q1
1
2
S
U
T1
3
T2
5
4
R
6
L1
L2
C1
C2
G
D1
D2
V1
V2
V3
M2
M1
N
F
E1
E2
7

what do you think?.....



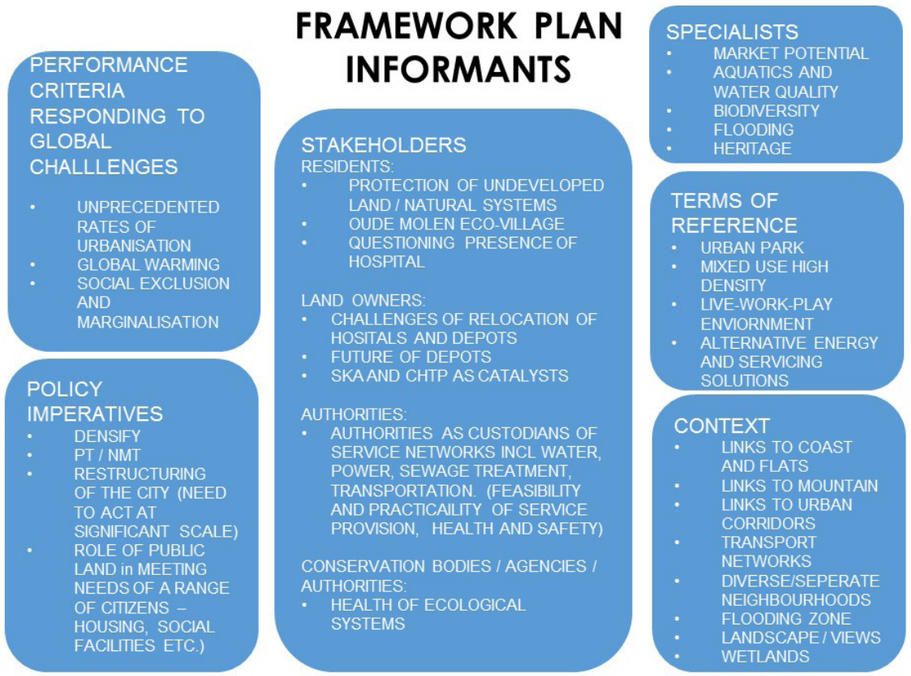


Fig.48 Framework Plan Informants

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

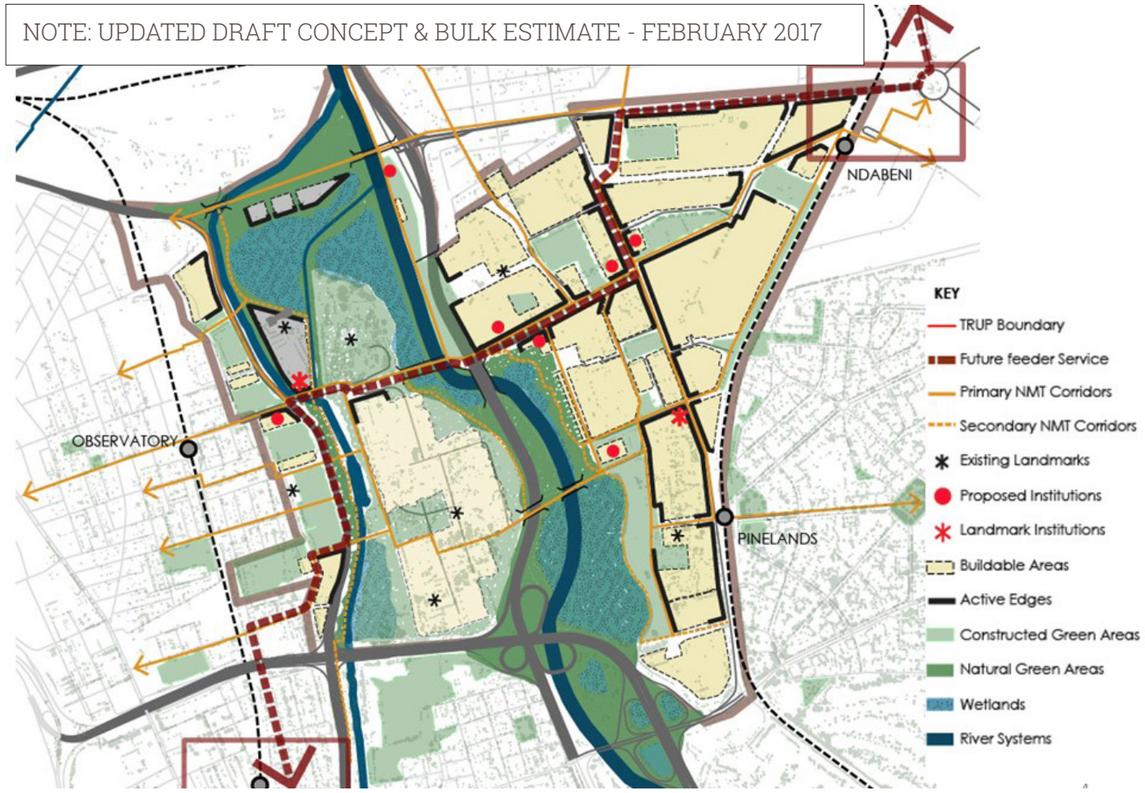


Fig.49 Draft Concept

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

Critical actions to address challenges:

- Bridging the river corridor and M5, **connecting east to west**
- **Connecting and extending current transportation service points** to support the making of a car deficit area
- **Creating a continuous NMT network**
- Providing more **points for contact with the water**
- **Rehabilitating and conserving** highly sensitive areas
- Reconfiguring less sensitive areas for passive recreation
- Locating **mixed use development** along the edges of the Park where appropriate
- **Reinforcing key points through intensification of land uses and creation of a network of public surveillance centres**
- Creating a green network of spaces that connect local communities to the Park
- Creating **gateway precincts** where events bring people from diverse backgrounds together
- Considering and including **catalytic projects**

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

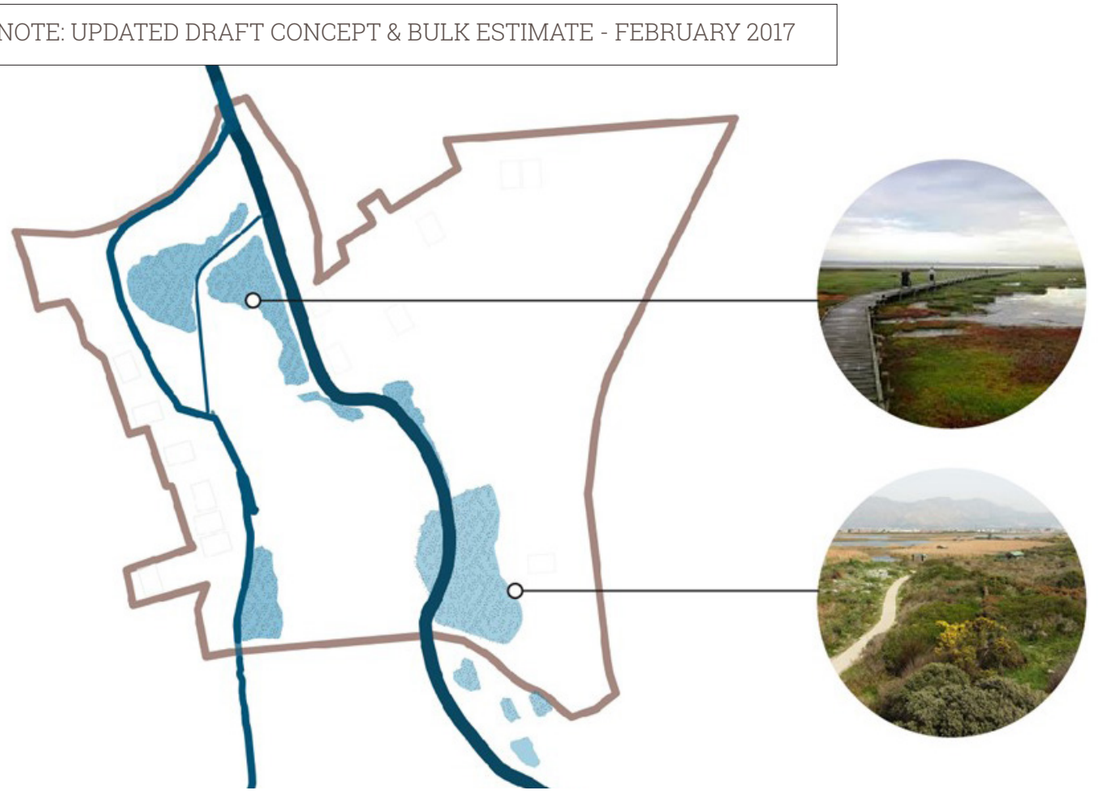


Fig.50 Water

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

Fig.51 Green Networks - Natural and Constructed

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

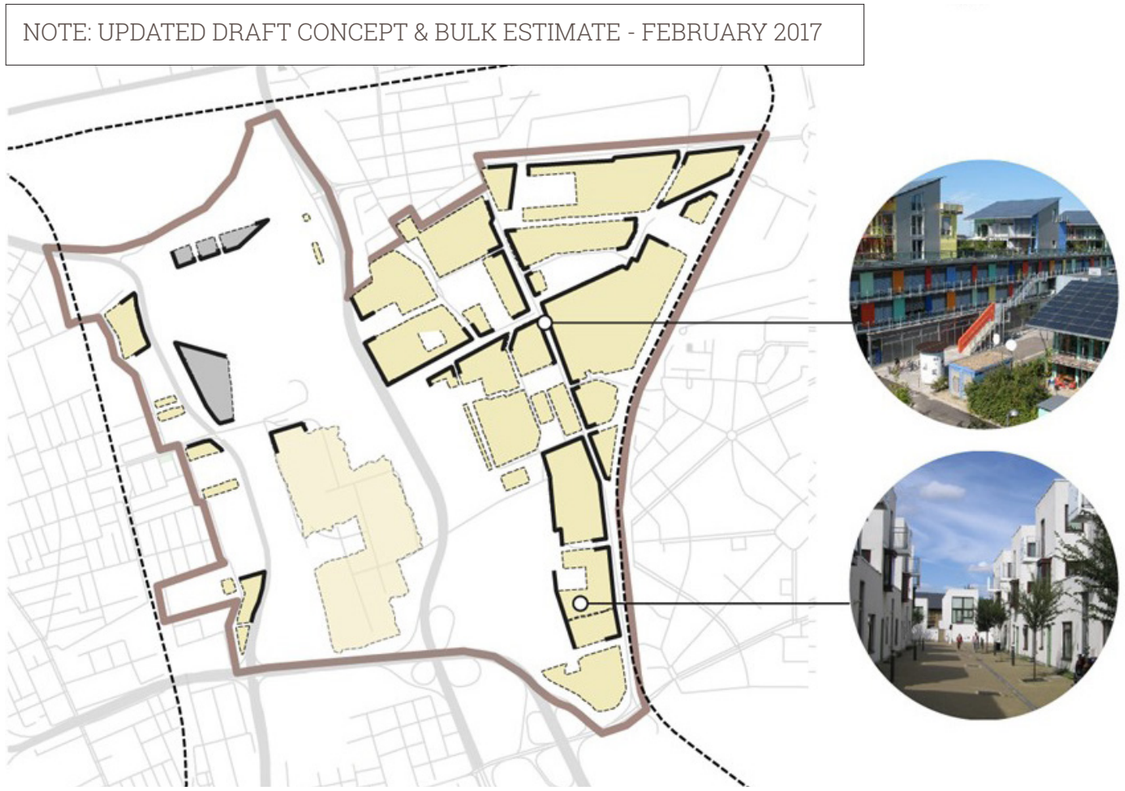


Fig.52 Buildable Areas and Edges

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

Fig.53 Transport

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

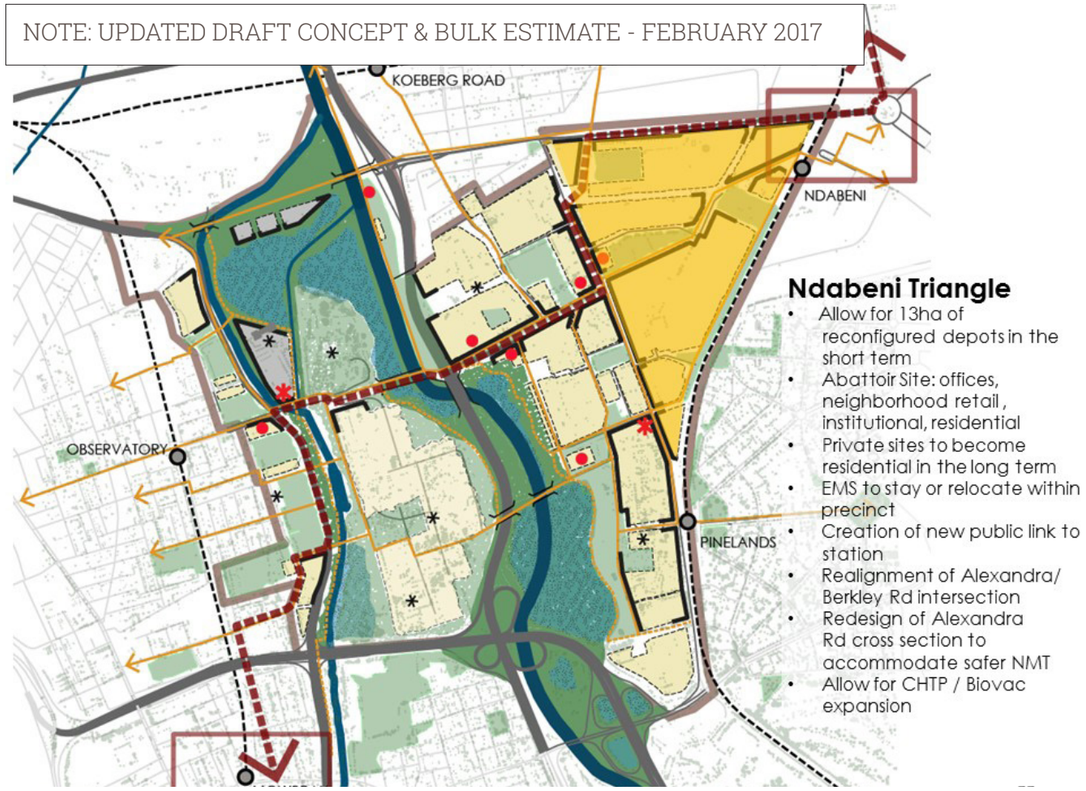


Fig.54 Ndabeni Triangle

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

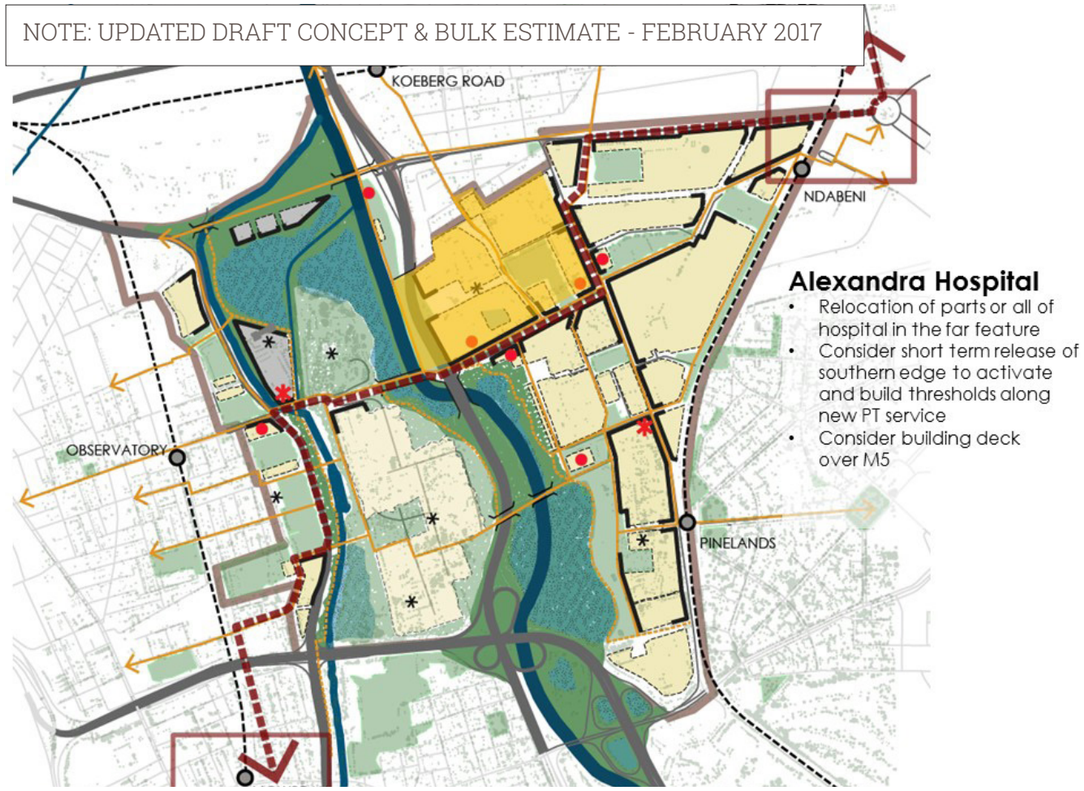


Fig.55 Alexandra Hospital

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

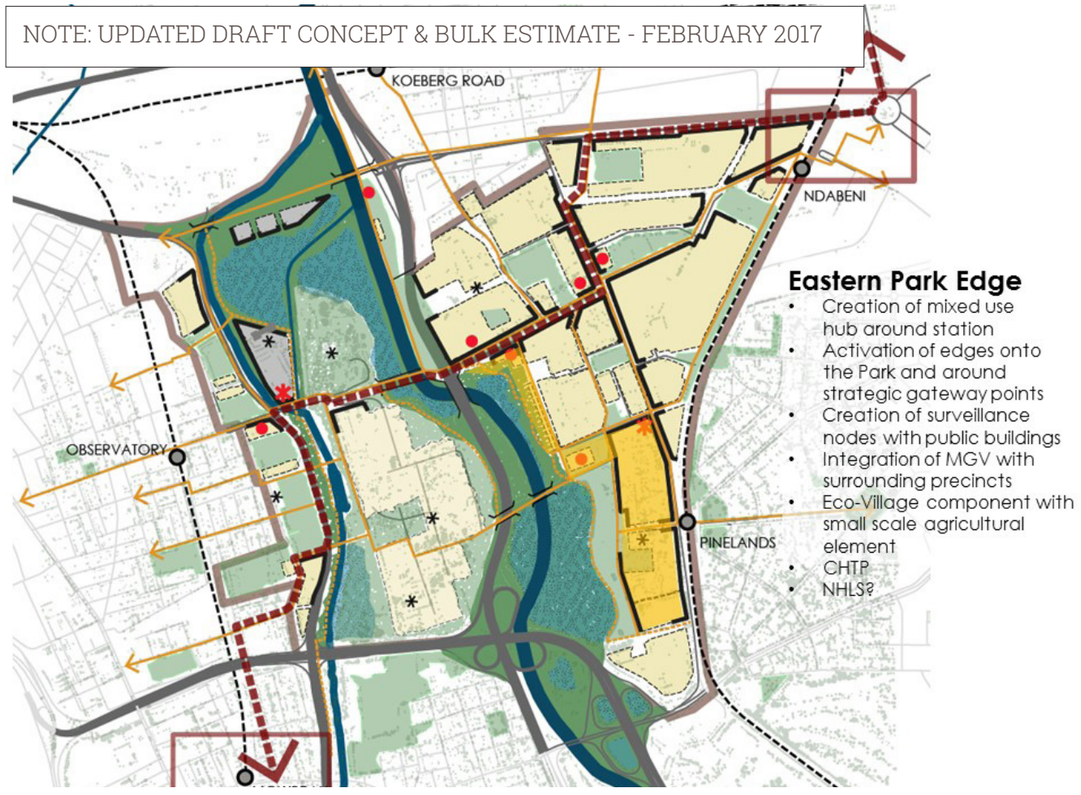


Fig.56 Eastern Park Edge

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

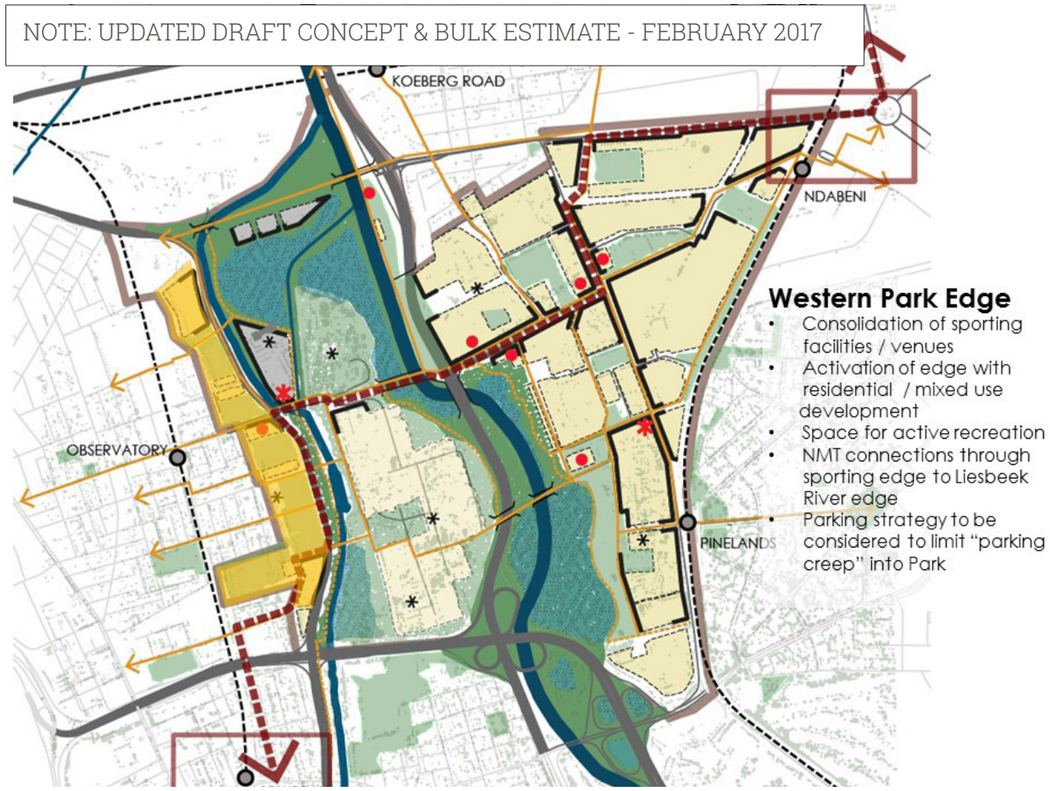


Fig.57 Western Park Edge

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

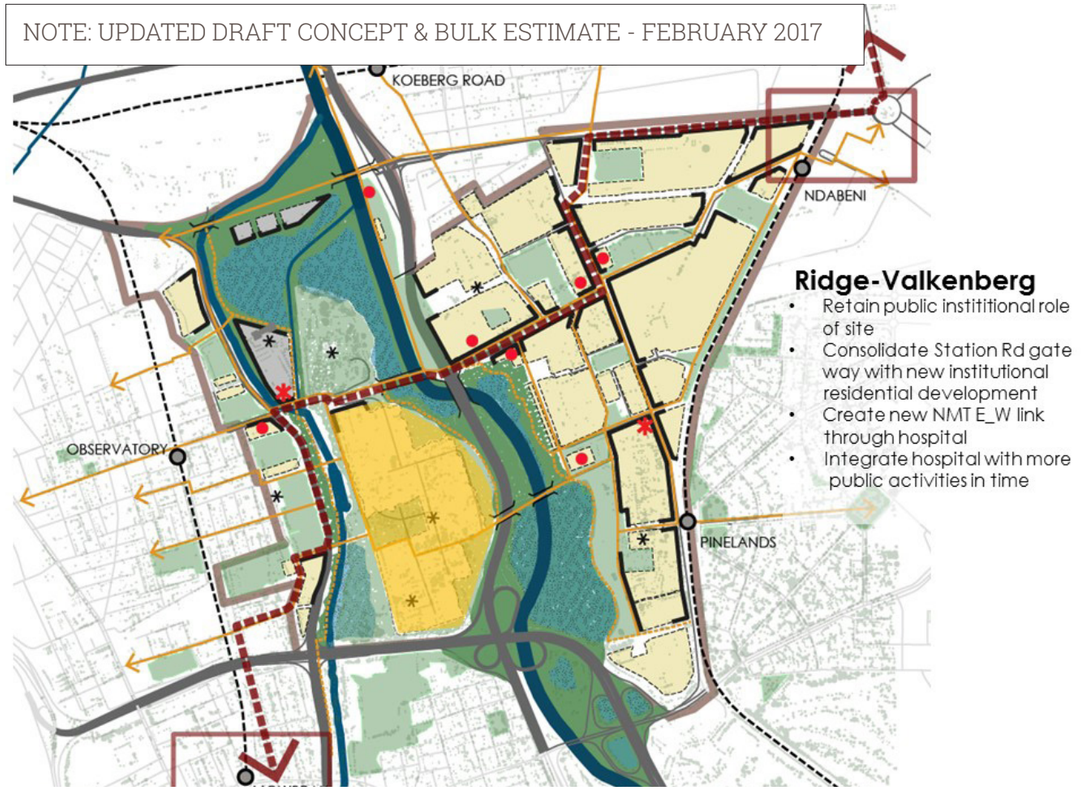
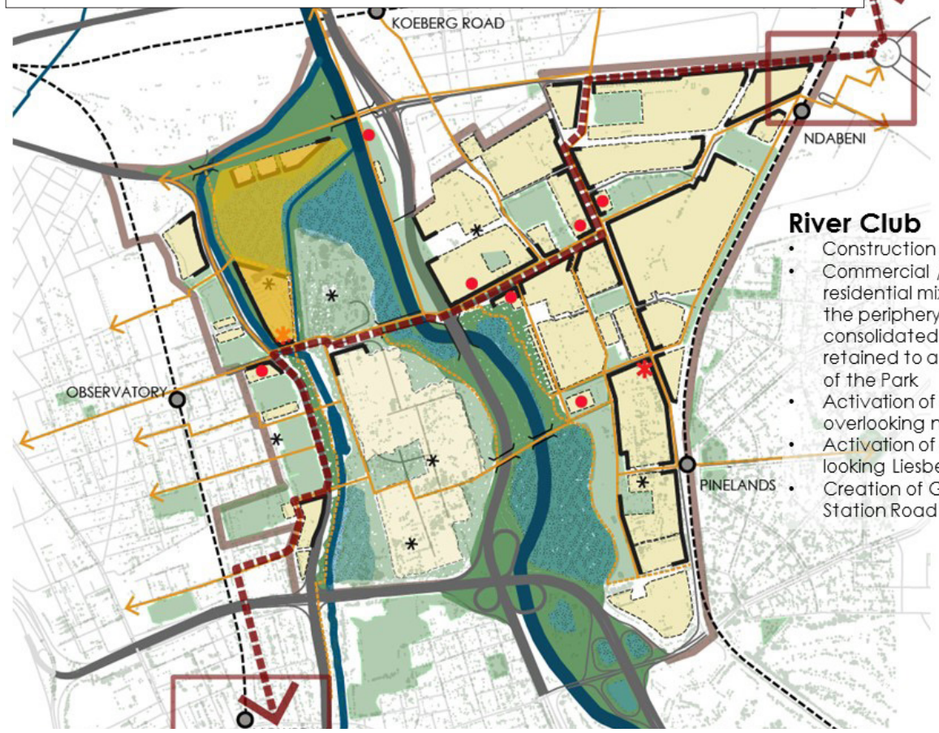


Fig.58 Ridge - Valkenberg

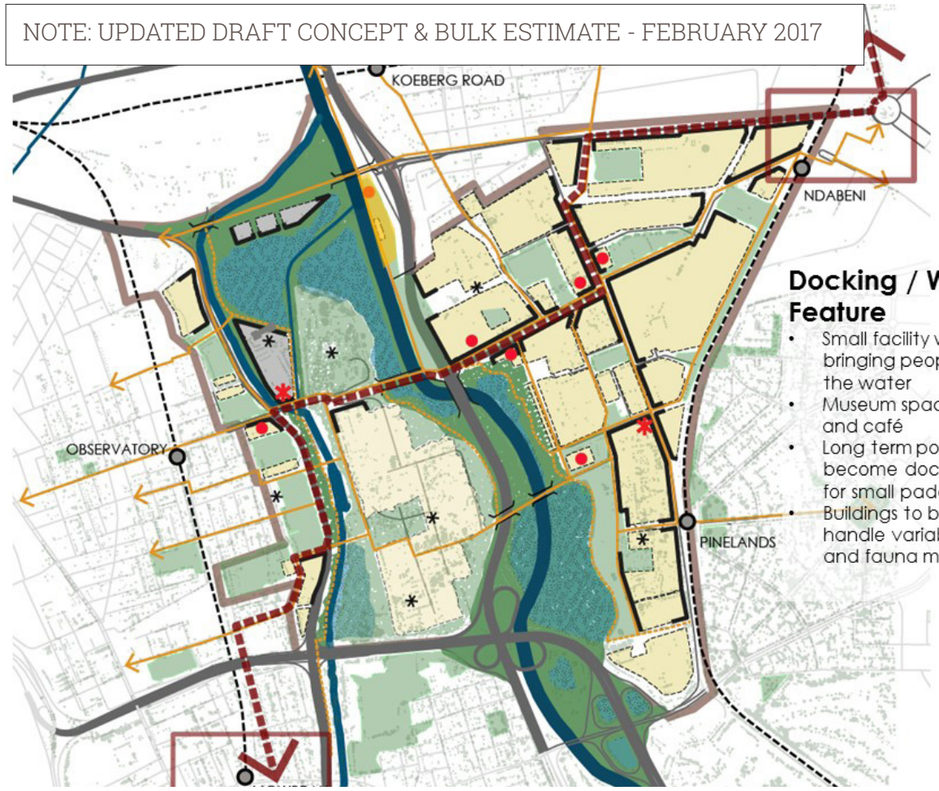


River Club

- Construction of Berkley Rd
- Commercial / office / residential mix with hotel on the periphery to ensure consolidated open space is retained to act as extension of the Park
- Activation of edges overlooking new park
- Activation of edge over-looking Liesbeek Parkway
- Creation of Gateway on Station Road

Fig.59 River Club

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017



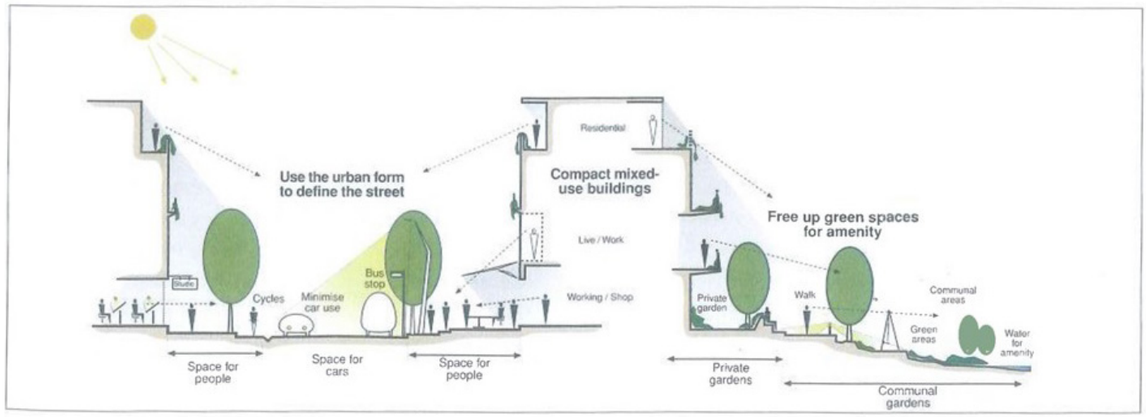
Docking / Waterfront Feature

- Small facility with decks bringing people closer to the water
- Museum space, info centre and café
- Long term potential to become docking facility for small paddle craft
- Buildings to be designed to handle variable water levels and fauna movement

Fig.60 Docking/Waterfront feature

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

- What activities and where in the horizontal & vertical plain do you locate them is artificial to determining the performance of the public realm
- Looking to create a vibrant, safe and comfortable public environment, scaled for the person on foot.



(Andrew Wright Associates)

Cross Section through a generic development edge showing a tree lined street enclosed by buildings with ground floor retail / commercial and or public facilities and upper level apartments with views over street spaces and shared green space / Park

Fig.61 Relationship between bulk, land use and form

Fig.62 Precedence

NOTE: UPDATED DRAFT CONCEPT & BULK ESTIMATE - FEBRUARY 2017

Moving forward

Footprint will be reconsidered according to amongst other things:

- Remodelled flood model findings
- Heritage Indicators (views etc.)
- Consolidated environmental constraints
- Alignment / location of future infrastructure

Land Use / Bulk will be reassessed in relation to, amongst other things:

- Thresholds required for transport services,
- Approach to parking provision and levels of service on roads CoCT,
- Feasibility of providing engineering services on site / off site and sustainability criteria wrt to servicing (do we have onsite water treatment and / or sewage treatment?)
- Land availability and phasing

notes

notes

13. Stakeholders' Design Exploration

Fig.63 Stakeholders' design exploration compiled by Marc Turok in collaboration with several stakeholder groups.

Concept | Hydrology and biodiversity

0 100 250 500

KEY

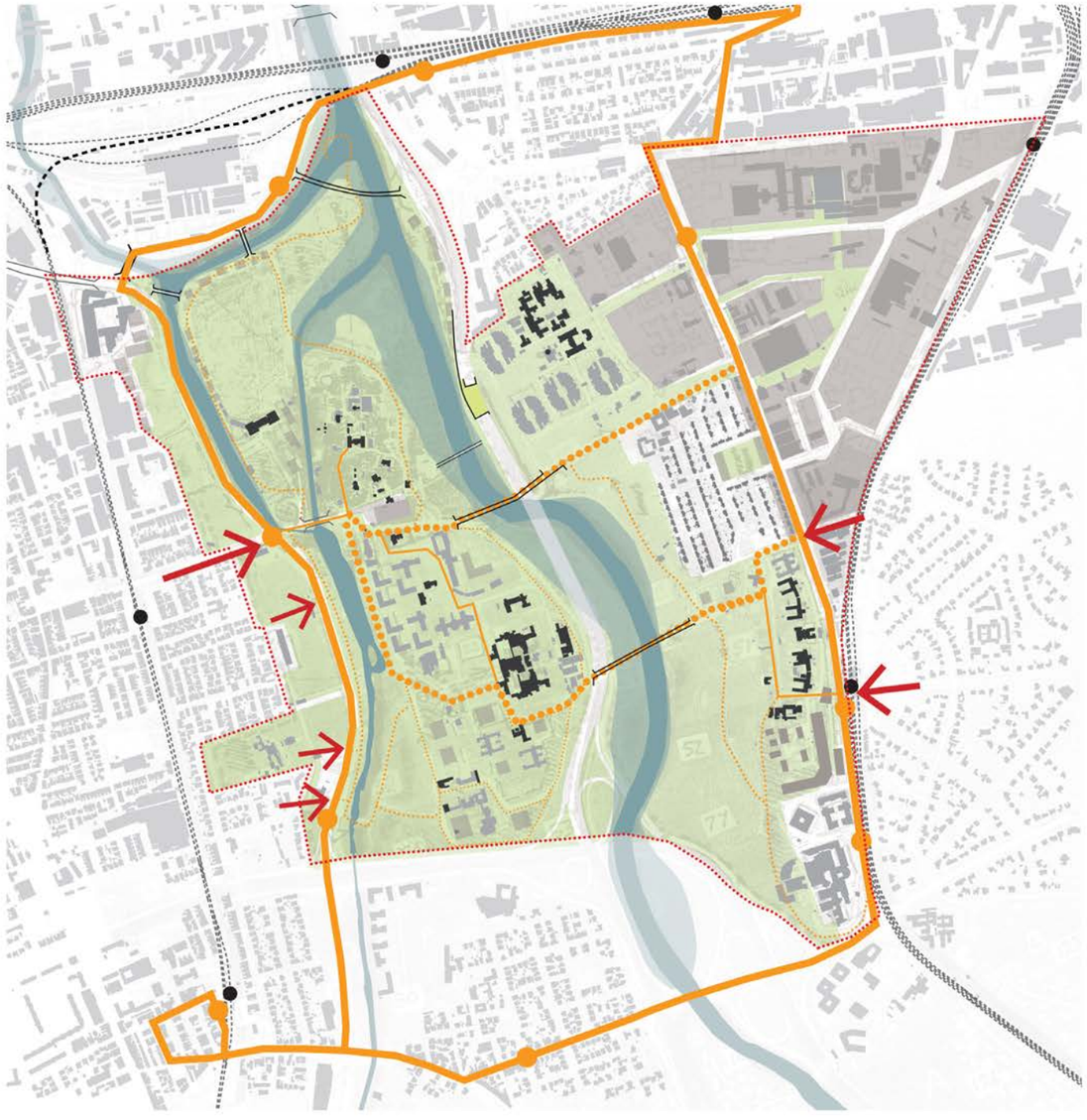
- TRUP site
- Existing rivers
- New river corridors
- Wetlands
- Green corridor
- Proposed development
- Heritage building
- Flood storage area
- New bridge
- Green Bridge
- Existing bridge
- 100 year floodline
- Biodiversity corridor

Concept | EDGES

0 100 250 500

KEY

- TRUP site
- Existing rivers
- Proposed development
- Green corridor
- Active edge
- Heritage or sensitive edge
- Enclosed edge
- New bridge
- Green Bridge
- Heritage building



Concept | ACCESSIBILITY

0 100 250 500

KEY

- TRUP site
- Rivers
- Wetlands
- Green corridor
- Proposed development
- Main access points
- PRT
- NMT
- Pedestrian
- Controlled access NMT and pedestrian route
- New bridge
- Green Bridge
- Existing bridge
- Reconfigured railway line

Concept | Cultural and social key destinations

0 100 250 500

- TRUP site
- Rivers
- Wetlands
- Green corridor
- Proposed development
- Heritage building
- Sportsfields
- New bridge
- Green Bridge
- Existing bridge
- Cultural and social key destinations
- Views

Concept | BUILDABLE AREAS

KEY

- TRUP site
- Medium to high density infill development
- Sensitive or low density infill development
- Pavilion type development
- Green areas

0 100 250 500

notes

part 5_ assessment matrix, working group results, minutes

TRU-Park Manifesto - objectives	City Imperatives	Stakeholders' non-negotiable objectives What if TRU-Park ...
1. To develop a **safe metropolitan urban park** based on sustainable principles and responsible management practices that is founded on a partnership between local communities, different tiers of government and other partners willing to invest resources. To design the park as a truly shared open space, triggering social inclusion; a new metropolitan destination accommodating tourism and enhancing ecological awareness.	I. Make more efficient use of **underperforming publicly owned** urban land.	A. Is an open public amenity **accessible to all.**
		B. Balances **environmental and recreational uses.**
		C. Enabling **recreational use of the rivers.**
		D. Enhances the perception and the **experience of the landscape.**
2. To restore and preserve the **ecological integrity** of the site as a special physical and visual amenity. To limit new building coverage and avoid building within the flood plain, to make provision for water flooding, water cleansing and water storage in order to enhance the recreational quality and environmental value of the site.	II. Conserve and protect **river corridors** and **open space systems** at the scale of the city and make them accessible to citizens and tourists alike.	F. Protects the integrity of the ecological systems - **green lung.**
		G. Enables and enhances **bio-diversity corridors.**
		H. Survey and protect **fauna and flora.**
		I. Enabling the **wetlands.**
		J. **Naturalising the river courses** [getting ride of concrete hard edges along the river]
3. To embrace a **sustainable environmental approach** that seeks to protect the natural qualities of the site and develop the precinct in a manner that respects the Earth's resources as well as natural environments, and that is in keeping with national and international best practices; to re-activate landscape for water cleansing, regulating air quality and urban food production.	III. Enhance **natural systems** to improve their economic, infrastructural and social role - key component of the new TRUP policy.	K. Enables **urban agriculture.**
	IV. Ensure **resilience** against the challenges of climate change [sea level rise, rising temperature, water scarcity].	L. Clean the water of the rivers through a broader **water purification strategy**
4. To promote the use of **sustainable modes of transport** [walking, cycling, public transport, etc…]; to discourage the dependency on private vehicular movement, to encourage the use of public transport, as well as support and encourage non-motorised transport and pedestrian movement.	V. Promote **Public Transport and NMT** in terms of Transit Oriented Development [ToD] Policy and reduce reliance on cars by reinforcing urban corridors and stations with more dense and intense forms of urban development.	M. Is a pedestrian and public transport based area **[reduced car/no car]**.
		N. Promotes the use of public transport through an extensive and strategic **IRT and NMT network.**
		O. Provides strategic [NMT] pedestrian and cycle links and bridges [re-introduce the bridge over Black river].
5. To provide **dense mixed-use, mixed tenure urban environment**, where appropriate, associated with the Park that is holistic and sustainable. Where-in people can safely live, work and play. In particular, to make provision for medium density affordable housing. To strive towards building a vibrant, safe, local resident community in which cultural diversity and tolerance could flourish.	VI. Promote a **compact city** for sustainability and efficiency reasons.	P. Has a wide variety of **social infrastructure.**
	VII. Address the **housing demand** by creating high density, socially mixed income and mixed use development/s, including **affordable housing**.	
	VIII. Address rapid **urbanisation** and **mainstream poorer citizens** into the urban economy - bring people closer to urban opportunities..	Q. Includes the development of **Alexandra Rd** as an **'activity street'.**
6. To develop **funding and local economic opportunities** geared towards sustainable development. These are geared towards community, public and private partnerships as well as the involvement of institutional investors. To mobilise new investments, create jobs and ensure that a significant component of the business premises are affordable for small and micro-enterprises, enhancing human capital and supporting social entrepreneurship.	VIII. Address rapid **urbanisation** and **mainstream poorer citizens** into the urban economy - bring people closer to urban opportunities.	R. Ensures the **continued functioning of existing activities.**
7. To align the development and the preservation with **clear management, administrative and institutional systems**. To bring government and public services closer to the people, and where required, to reform legislation. To develop and find new ways and forms of entrepreneurship to ensure sustainability and sustain the quality of the public spaces in the TRU-Park through good urban and environmentally appropriate management.	I. Make more efficient use of **underperforming publicly owned** urban land.	
8. To develop TRUP as an **integrative space** that responds to culture, heritage and memory of the site – a place that joins together this region of the city and its local communities, rather than continuing to serve as a 'barrier space' and therefore, assists in undoing apartheid spatial planning and attending to the needs of the current and future communities. This is to be implemented with sensitivity to the heritage of the site and be inclusive of the diverse cultural characteristics.	VIII. Address rapid **urbanisation** and **mainstream poorer citizens** into the urban economy - bring people closer to urban opportunities.	S. **Extends to the sea and to Langa**
		T. **Celebrates the diverse cultural narratives** associated with the site.
		U. Identifies spaces for **ceremonies and rituals.**
		V. Protects and enhances the **heritage landmarks and views.**
		W. **Mitigate** the impact of infrastructural and natural **barriers** across the site.
9. To establish a **social partnership** that can form the basis of cooperation between the various stakeholders, which can address the inequalities of the past, include the marginalised sectors of society, prioritise public rather than private interest as well as help build viable enterprises; to enhance existing communities [e.g. Maitland Garden Village], organisations and programmes within the TRU-Park area.	VIII. Address rapid **urbanisation** and **mainstream poorer citizens** into the urban economy - bring people closer to urban opportunities.	X. Includes the **Maitland Garden Village** development strategy.
10. To develop, where possible, **alternative systems of technology** - resource efficient sustainable technologies – that are viable as well as financially feasible and which could demonstrate alternative modes of urban living. TRU-Park as showcase of sustainable living [zero waste, passive design, renewable energy, local materials, climatic responsive design, …].	IX. Demostrate **alternative ways of addressing infrastructure** [energy, waste, water, etc.] to promote sustainability.	

Fig.64 Alignment between TRU-Park Manifesto objectives, City imperatives and Stakeholders' non-negotiable objectives.

Movement Network and TOD

(PLEASE NOTE: **BLUE** represents comments by **STAKEHOLDERS; RED** represents comments by **PUBLIC SECTOR OFFICIALS; BLACK** represents comments by both **STAKEHOLDERS & OFFICIALS**)

Spatial Element	Scenario	Alignment			Commonalities	Differences	Comments
		TRU-Park Manifesto objectives	City Making Imperatives	Stakeholders' non-negotiable objectives What TRU-Park...			
Berkley RD	**A**				• There is a need for it • Connection is enabled	• Alignment and location • Type of road • Land Ownership (PRASA versus CoCT)	• PRASA is investing R1.3 billion into upgrading their land north of the River Club. As such, expecting that they will allow for the Berkley Road extension to be constructed on their land is not a reality.
	B						
IRT/Bus Routes	**A**	NOTE: IDENTIFIED MAINLY THE COMMONALITIES & DIFFERENCES			• Public transportation is provided • Public transportation is seen as a priority • A reduction in private vehicle usage is enabled • A mind shift to IRT is enabled • Public transportation routes run through park (although to different extents)	• In Scenario A, public transportation routes cut through the park, while in Scenario B, public transportation routes run along the edges of the park • Alignment • Length of route (B is far longer) • Surveillance ('eyes') over the park	• Scenario B is less efficient than Scenario A • The Scenarios do not exclude each other, but merely have a different emphasis • Scenario B does not link to the metropolitan network
	B						
Key bridges	**A**				• Permeability is enabled • Social cohesion and connection are enabled • Accessibility is enabled • The extension of Station Road is emphasised in both Scenarios • The Valkenberg footbridge is a key feature in both scenarios	• The type and scale of the proposed bridges • Alignment • Capital expenditure	• No footings should be allowed in the water
	B						
NMT Routes	**A**				• Access to the park is enabled • Walking along the river is enabled	• In Scenario B, there is no link via Valkenberg	• Maitland Garden Village is key to enabling NMT routes across the TRUP site
	B						
Stations	**A**				• The issue is not the stations themselves, rather the IRT/NMT links to the stations need careful consideration • Station upgrading would be required	• There is a different emphasis on particular stations, particularly which stations are to be upgraded	• Large numbers of people are required to support the 7 rail stations which surround the TRUP site
	B						
Mixed use	**A**				• Mixed use development is widely promoted	• Scenario A focuses on the TRUP study area, while Scenario B make proposals for developing outside of it • Emphasis on different locations for mixed-use development • Scenario A includes more development in Oude Molen, Hartleyvale and Malta Park	None
	B						

Fig.65 Results from the CO-design Workshop from the Movement Network and TOD working group

Movement Network and TOD

(PLEASE NOTE: **BLUE** represents comments by **STAKEHOLDERS; RED** represents comments by **PUBLIC SECTOR OFFICIALS; BLACK** represents comments by both **STAKEHOLDERS & OFFICIALS**)

Spatial Element	Scenario	Alignment			Commonalities	Differences	Comments
		TRU-Park Manifesto objectives	City Making Imperatives	Stakeholders' non-negotiable objectives What TRU-Park...			
Berkley RD	**A**				• Social facilities are included • Social facilities offer surveillance over the park • Social facilities are attractors	• Scenario A takes population thresholds into account to approximate the overall space requirements of the general social facilities which would need to be incorporated into the overall development. • Scenario B is very specific as to exactly what types of social facilities should be located in specific areas, but is not backed up by evidence of need	None
	B						
IRT/Bus Routes	**A**				• Mixed housing is located in all development areas • Cross subsidization is needed to enable development	• The proportion of housing types is different between the two scenarios. Scenario A is more equitable (50% marketl; 50% comprised of social, affordable and student housing). Scenario B is more market driven, and there is hesitance to mix housing types within individual buildings.	• Incentives are needed to get developers to mix housing
	B						

NOTE: IDENTIFIED MAINLY THE COMMONALITIES & DIFFERENCES

Fig.66 Results from the CO-design Workshop from the Movement Network and TOD working group

FUTURE DEVELOPMENT

(PLEASE NOTE: **BLUE** represents comments by **STAKEHOLDERS; RED** represents comments by **PUBLIC SECTOR OFFICIALS; BLACK** represents comments by both **STAKEHOLDERS & OFFICIALS**)

Spatial Element	Scenario	Alignment			Commonalities	Differences	Comments
		TRU-Park Manifesto objectives	City Making Imperatives	Stakeholders' non-negotiable objectives What TRU-Park...			
Ndabeni Triangle	**A**	4, 5, 6, 8, 9, 10	5, 6, 7, 8, 9	n, q, r, t, x, a, d, g, o, q	• Higher density is appropriate • NMT Link to Ndabeni Station is required • Local economic development potential • Live-work- play achievable • Green spaces	• Realignment of Alexandra Road in A • Berkley Road extension in A. • 13ha of land proviisionally allocated to CoCT depots in A	• Note: Investment in Water + Sanitation is relatively low in relation to investment required for electricity and transport infr. etc. • Densities incomparable • Bulk Incomparable. >Appropriate densities and bulk to be established • Stakeholders indicated that they would support increased bulk in Ndabeni to trade-off for lower densities elsewhere on TRUP
	B	4, 5, 6, 8, 9, 10	1, 6, 7, 8, 9	m			
Alexandra Hospital	**A**	6, 8, 9, 10	5, 6, 7 8	a, b, c, d, f, g, h, m, l, j, k, r, o, q, x, w, (Potential for all of these)	• Southern Edge borders along new E-W • Mixed Use development	• Staggered interface (density and height) increasing with distance from Black river proposed in B • Staggered height in B could go up to 5 stories • Ave Height of 5 stories in A • Deck over M5 in A	• Difference in approach to housing for poor is unclear - esp. for B • Proposals must support links across park • Tourism potential of windmill- capabilities and opportunities must be looked at
	B	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	5, 6, 7, 8				
Cape Health Technology Park	**A**	10, 9	1, 3, 5		• Agree that CHTP can be within the larger TRUP area • Both agree that S and O are an Investment opportunity • Economic sustainability at all levels. (for large and small operators) is important	• CHTP is not part of B • Must be located somewhere else on TRUP other than Oude Molen	• Two potential locations - Ndabeni and Oude Molen • CHTP = Investment opportunity • Risk to livelihoods on Oude Molen (Strong concern for S group) • Further discussions of sharing of info required • Could be considered on Ndabeni ?? • Need it as catalyst • Question was raised about CHTP employee travelling behavior - if they rely on vehicles there is a concern for whether the OM precinct can fulfil agenda of more sustainable dev.
	B	6, 5, 8					
Oude Molen Eco Village	**A**	1-10, except 5 because of the word 'dense'	1-8, 9	a-x except S+J	• Both include Eco village	• In Scenario A, the eco-village takes up half of Oude Molen • Form of development envisaged in Oude Molen different between A + B	• Concern about gentrification resulting from higher densities
	B	*officials adding 5 * qualified 6					
Oude Molen Precinct	**A**				• Both identify Oude Molen as strategic • Preservation of current heritage • Tourism potential of precinct	• A doesn't put building footprints in • Differences in density / intensity and footprint coverage	• Public access must be secured
	B		8 is more applicable to B				

Fig.67 Results from the CO-design Workshop from the Future development working group

FUTURE DEVELOPMENT

(PLEASE NOTE: **BLUE** represents comments by **STAKEHOLDERS; RED** represents comments by **PUBLIC SECTOR OFFICIALS; BLACK** represents comments by both **STAKEHOLDERS & OFFICIALS**)

Spatial Element	Scenario	Alignment			Commonalities	Differences	Comments
		TRU-Park Manifesto objectives	City Making Imperatives	Stakeholders' non-negotiable objectives What TRU-Park...			
Square Kilometre Array/ SAAO	**A**	6, 9, 10			• Both included SKA • SKA= Strategic Project • Both in 'gateway' from the west	• Differences in location - one on Riverclub precinct and one on Valkenberg Hospital Land	• Footprint and height a concern • SKA should support solutions which are Environmentally Sustainable, Infrastructurally Sustainable and, Institutionally sustainable
	B						
Valkenberg West	**A**	must start to address 8! Because they currently don't tick this box			• Berkley Road extension • Rehabilitation of Liesbeek River edges • Retention of main building • Open space = constructed wetland with hydrological role		• Fencing as a secure precinct is a concern
	B						
River Club	**A**	4, 5, 6 (1-10 Potential for all of these) 4, 5, 6	1-8, 9		• Berkley Road extension • Rehabilitation of Liesbeek River edges • Retention of main building • Open space = constructed wetland with hydrological role	• Location (alignment) of Berkley Road extension • Bulk difference, footprints are different • A (North and South), B(Peripheral) • A has a tighter footprint with consolidated open space in the middle • B Proposes development of PRASA land	• Land swap possible? • Affordability & housing a concern - will it address cross section of housing needs?
	B	everything except 6, 7, 8, 1-9 potentially					

Fig.68 Results from the CO-design Workshop from the Future development working group

Additional Comments

Ndabeni Triangle:

- Very little information was given regarding bulk in concept B
- Both stakeholders & officials do not have a problem with development but it was hard to compare A + B because A has footprint and B does not
- Stakeholders & Officials: No problem with Ndabeni going higher in terms of storeys and densities
- The engineers (Officials) highlighted that the investment required in transport and electricity is more than would be required for water and sanitation & that housing & transport must dictate services
- Both stakeholders & officials agree on the need to focus on Economic, Heritage/Cultural & Environmental sustainability of projects to be located in TRUP

Alexandra Hospital:

- The team agreed with appropriate densification
- The question was raised why do we need more mixed use facilities: critical difference between high density (A) vs more density (B)
- The question was raised of the tension between mainstream urbanization & economic opportunity for the poor & what does this mean for lower income groups?
- The group identified the windmill as opportunity for small businesses, tourism

Cape Health Technology Park

- Location issues!!
- It was questioned where the best location would be for CHTP: The stakeholders said no to Oude Molen & yes maybe to Ndabeni.
- The group agreed upon further discussion offline - between stakeholders, officials & CHTP.
- It was identified that TRUP needs CHTP for investment opportunity, it's a potential structuring point.
- However, certain individuals felt that CHTP will destroy Oude Molen, they believed CHTP only wants to locate their operations in Oude Molen so that they can be seen from the highway.
- There was consensus that within the TRUP, there is a need for economic activity, but CHTP's location is key
- There were questions regarding the social investment from CHTP for the TRUP site.
- A question was raised regarding the difference between LED and big corporate driven economic development & what this means in terms of the future of TRUP's economic development potential.
- The question was raised regarding technological companies such as CHTP & if they buy into public transportation or only use private transportation.

Oude Molen Eco Village

- The stakeholders questioned the justification for low density in terms of SDF + IDP
- It was questioned how issues such as gentrification will be dealt with in terms of the future of TRUP
- The group wanted more information regarding the Kirstenbosch model and who benefits from such a model if the Eco village had to adopt it.
- It was stated that the city only supports compact/dense development & cannot allow footprints of low density in areas such as Oude Molen

Square Kilometre Array/SAAO

- Some stakeholders were concerned that the decision about the location of SKA had already been made.

Valkenberg West

- A question was raised about how the Valkenberg upgrade fits into the TRUP plan, especially with the proposed 1.15 billion rand upgrade
- The team proposed more integration of Valkenberg into the rest of the site if it did stay in its current location.
- Clarification on ownership was requested: Confirmation that it is a provincial property given
- Evaluation process is too complex & not realistc for time & number of people
- Stakeholders: "A bigger focus should be on how eco villages can be beneficial for TRUP"
- Dutch Team: "There are lots of possibilities for infrastructure and affordable housing (needs to be unpacked) on eco villages, but depends on budgets/ if it will enhance the TRUP or not"

GREEN CORRIDOR

(PLEASE NOTE: **BLUE** represents comments by **STAKEHOLDERS; RED** represents comments by **PUBLIC SECTOR OFFICIALS; BLACK** represents comments by both **STAKEHOLDERS & OFFICIALS**)

Spatial Element	Scenario	Alignment			Commonalities	Differences	Comments
		TRU-Park Manifesto objectives	City Making Imperatives	Stakeholders' non-negotiable objectives What TRU-Park...			
Raapenberg wetland	**A**				• Bridge • Naturalising river edges	• Public transport versus footbridge	• Limited access to bird sanctuary • No bridge through wetland • No boating in bird sanctuary
	B						
Driving Range Open Space	**A**					• Too many foot paths in (A) • Cultural centre (B) • Urban agriculture	• Unsure if there should be access • Urban agriculture not applicable
	B	NOTE: IDENTIFIED MAINLY THE COMMONALITIES & DIFFERENCES					
Valkenberg/ Palloti wetland	**A**				• Protecting wetlands • No buildings • Development footprint	• Access paths • Berms • Two new bird hides	• Keep integrity of Maitland Village • Does not address housing
	B						
Liesbeek Parkway North	**A**				• New buidlings	• Diminishes / reduces recreation (A) • Respects floodplain (B) • Respects recreational areas (B) • Scale of new buildings	• New flood study - check impact on buildings
	B						
Liesbeek Parkways South	**A**				• Untouched reed beds	• Proposes urban agriculture (A) • Stormwater retention • Removal of parking	• Not appropriate - urban agriculture • Who will maintain urban agriculture
	B						
River Club Open Space	**A**				• Green zone • Both developments propose development at the River Club • Both have bridges	• Extent of buildings • Position of Berkley road • Extent of greenzone • No infill required (B) • Scale of developments	• Not looking at latest River Club proposals • Development too close to bird sanctuary
	B						
Hartleyvale Precinct	**A**				• Retain sportsfield • Public access through the area	• New developments (aquaculture centre) • Pedestrian connection	None
	B						
Covering of M5	**A**					• Sportsfield over M5 (A)	• Expensive investment scenario • Visual impact of tunnel • Impact of tunnel on bird sanctuary • M5 not covered in scenairo B • Covering M5 mitigates against noise
	B						
Docking Station	**A**					• Location of heritage centre (B)	• What happens to main electrical servitude?
	B						

Fig.69 Results from the CO-design Workshop from the Green corridor working group

Item	Name	Organisation	Theme	Question/Comment	Response
Flood Modelling and Watercourse Management Plan - Marieke De Groen	Kyran Wright (Stakeholder)	Friends of the Liesbeek and TRUP Association	Floodline Modelling	Given the mistake made with the flood line modelling for the TRUP area, does this affect the results of the River Club's modelling?	**Marieke De Groen (Expert):** The River Club is aware of the incorrect modelling, and engagements have taken place with the consultants who have done the River Club's modelling. RHDHV's flood modelling results are similar to the findings of the River Club.
	Frans Van de Ven (Expert)	Dutch Consultant Team	Scenario 7	In terms of Scenario 7, what is the impact of infilling areas (especially the River Club) on the flood lines? Is filling taken into account?	**Marieke De Groen (Expert):** In terms of the urban planning footprints we have, we see a 5cm rise
	Marc Turok (Stakeholder)	TRUP Association and Observatory Civic Association	Flooding	Mention was made of a 5cm rise during the 1:100 year flood event. What about the levels of flooding at other times? Would infilling in the floodplain not impact on the 1:20 and 1:50 year flood events?	**Marieke De Groen (Expert):** The 5cm rise is for the 1:20 and 1:50 year flood events. The 1:100 year flood line has not yet been modelled. RHDHV modelled the higher frequency floods first.
	Liz Wheeler (Stakeholder)	Friends of the Liesbeek	Floating Wetlands	Floating wetlands have been successful in vleis, but not in rivers. What would happen to these floating wetlands during periods of flooding?	**Marieke De Groen (Expert):** The floating wetlands will not be placed in the main river. They could be positioned in areas where boardwalks are located, for instance adjacent to Oude Molen.
	Kendall Kaveney (Public Sector)	CoCT	Maintenance	Huge operational efforts are required to maintain litter traps. Have you considered who will be maintaining these in your designs? In the past, maintenance has cost the city large amounts of financial resources.	**Marieke De Groen (Expert):** It is agreed that litter traps are not considered feasible since the capital and operational costs are high. In the report, we have stated that the preference is for maintenance teams, although there is reference to proposed litter traps.
Engineering Services Model (Water and Sanitation) - Tezren Pandither	Jean Ramsay (Stakeholder)	TRUP Association	River Club Bulk	In the Consultant Team's proposal (Scenario 7), 5 large buildings are shown in the River club area. However, 22 buildings are shown in the River Club's proposals. What is the actual bulk proposed for the River Club?	**Jody Paterson (Expert):** There is a disjuncture between what we have proposed and what the River Club has proposed. We had to get something down so that the Engineers could undertake service capacity investigations. **Geoff Underwood (Stakeholder):** The River Club is proposed to be about 130 000 square metres.
	Kendall Kaveney (Public Sector)	CoCT	Water and Sanitation	Athlone WWTW is at capacity, as are the pump stations in the area. TRUP is currently in competition with five other developments in the area for the provision of services i.e. water and electricity. The Mayor's office is currently trying to measure the availability of resources and the city's demand, so that future developments can be granted development rights based on capacity of services within the City.	**Tezren Pandither (Expert):** We are aware of the capacity constraints, and we are in discussion with CoCT regarding the upgrading of infrastructure.
	Carol Clark (Stakeholder)	Pinelands Ratepayers Association	Sewage	Sewage is leaking and overflowing in Pinelands, and residents are not able to flush their toilets. Has this been considered in the bulk calculations and sanitation proposals for TRUP? How will this affect / address the issue in Pinelands?	**Tezren Pandither (Expert):** Leaking sewage in Pinelands is acknowledged. Bulk and sanitation services have been considered all the way to Athlone Waste Water Treatment Works (WWTW). There could be blockages along the line to the WWTW, and the consultants are working with the City of Cape Town's Department of Water and Sanitation. Although the leaking / blocked sewerage system in Pinelands cannot be addressed by the water engineering services team, it can be raised with the CoCT DWS.
	Jean Ramsay (Stakeholder)	TRUP Association	Sanitation	Have you considered the use of dry toilets in the TRUP proposals?	**Tezren Pandither (Expert)**: Dry toilets have not been considered in the TRUP proposals, but they can be looked at. It should be noted that the environmental impacts would need to be considered in terms of disposal, and the contaminants it contains.
Transport Engineering Services Model - Rory Williams	Marc Turok (Stakeholder)	TRUP Association and Observatory Civic Association	Modes of Transport	The traffic flow maps do not reflect the various modes of transport. It also does not reflect the impact of the use of rail in the greater TRUP area. Considering that the infrastructure is available (while acknowledging that the rail system is not completely functional), why has this not been included? Also, its unclear as to whether only the peak is taken into account.	**Rory Williams (Expert):** It is agreed that numbers for the various modes of transport are not given on the map. It is agreed that rail forms the backbone of the area and the number of individuals using rail have been assumed in the model. There is a need to understand the flexibility of the network and that roads can be used programmatically i.e. some roads can be closed to traffic at some times of the day. Shared mobility is also very important and has been considered in the model. Further details need to be considered.
Environmental and Heritage Baselines and Market Potential - Jody Paterson	No questions on this section			No questions on this section	

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Item	Name	Organisation	Theme	Question/Comment	Response
LSDF Planning Process - Nisa Mammon and Piet van Heerden	Geoff Underwood (Stakeholder)	Planning Partners	Status of LSDF	Can you please confirm that the LSDF will set the policy for the area, which will serve as a guideline to the authorities when reviewing applications? For site specific issues, can you please confirm that deviations from the LSDF can be applied for?	**Piet van Heerden (Public Sector):** Both statements are correct. When the LSDF is formally adopted by the CoCT, it will form the policy for the area and will override the 2003 Contextual Framework. Site specific circumstances allow developers to deviate from the LSDF. However, this will need to be motivated and advertised.
	Lynette Munro (Stakeholder)	TRUP Association	Timeframe	What are the timeframes for the LSDF?	**Nisa Mammon (Expert):** The Draft LSDF report will be circulated for comment on 31 July 2017. The Final Draft will submitted on 30 October 2017. CoCT is expected to complete the internal adoption processes by 31 March 2018.
	Carol Clark (Stakeholder)	Pinelands Ratepayers Association	Timeframe	How does the River Club's proposal affect the timeframe for the LSDF?	**Geoff Underwood (Stakeholder):** The River Club will be submitting a Scoping and Environmental Impact Assessment. Any application submitted by the River Club needs to be considered by the competent authority (i.e. DEADP), as the department cannot stop an EIA application because of a planned policy change. Authorities need to consider all of the work completed for a project, including the specialist studies, modelling etc. The competent authority will approve an EIA application if it meets all the considered requirements i.e. Spatial Planning Land Use Management Act, National Environmental Management Act etc. However, an Environmental Authorisation is not always guaranteed. In terms of the River Club, the EIA process has started and the final EIA report will be submitted in the third quarter of the year. The competent authority may take another 9 months to consider everything. A final stakeholder engagement process would need to take place thereafter.
					Nisa Mammon (Expert): CoCT cannot stop any applications from being submitted for assessment. If the River Club submits their planning application before the LSDF is approved, the River Club's application would need to be assessed in terms of the 2003 TRUP Contextual Framework.
	Mark Callaghan (Stakeholder)	Rosebank and Mowbray Planning and Aesthetics Committee	River Club	How will the authorities deal with proposals from the River Club, if the proposals contradict the intentions of the LSDF.	
	Sandy Hustwick (Public Sector)	CoCT	Hierarchy of Planning Frameworks	Will the LSDF override the Cape Town SDF and the Table Bay District Plan? How will conflicts between the larger scale frameworks and the LSDF be addressed? If proposals received are not in line with these policies, would the policies first need to be amended before the proposals are approved?	**Piet van Heerden (Public Setor)**: City of Cape Town has multiple layers of policy. The LSDF will not override the larger scale policies, but will contextualise them.
	Marc Turok (Stakeholder)	TRUP Association and Observatory Civic Association	SKA	Reference is always made to the River Club, but what is happening with the Square Kilometre Array (SKA) project? What are their proposals? The River Club has heard nothing about the development, but the SKA site is located at the entrance of the River Club. What conversations are taking place? What is happening in the background?	**Jody Paterson (Expert):** SKA is still interested in being located within the TRUP area, specifically located on the NRF owned land adjacent to the River Club.
					Piet van Heerden (Public Sector): Nothing is on the table yet. To date, there haven't been any requests from SKA's side to attend any meetings.
Stakeholder Scenario - Mark Turok, Hudson McComb & Lynette Munro	No questions on this section			No questions on this section	
Green Corridor Management Plan - Kathrin Krause	No questions on this section			No questions on this section	
Developable Areas - Jody Paterson	No questions on this section			No questions on this section	

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Item	Name	Organisation	Theme	Question/Comment	Response
Consolidation - Michael Krause	Mark Callaghan (Stakeholder)	Rosebank and Mowbray Planning and Aesthetics Committee	Heritage and Reclamation	Apologies for not participating earlier. The reasons for not participating is because RAMPAC felt that the consultants were capable of handling the process. RAMPAC's first participation was commenting on the baseline heritage study, and we were appalled at what was presented. RAMPAC feels the consultants need to go back in history, and suggests that exploration of the reclamation of the Liesbeek riverine corridor needs to be considered. The consultants need to consider what would be required to remove the fill along the Liesbeek riverine corridor. RAMPAC is not opposing development, but the consultants need to relook at the proposals being presented. RAMPAC does not agree with proposals made for River Club.	**Michael Krause (SUN Development - Facilitator):** Thank you for your comments, which will be noted. The comments would also be taken into consideration in the HIA processes.
The Way Forward - Bronwen Griffiths	No questions on this section			No questions on this section	

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